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ORIGINAL ARTICLES.

THE USES OF REMEDIES IN DISEASES OF THE HEART AND BLOOD-VESSELS.

Presented to the Section of Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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It is obvious that the scope of my paper is so large that if I were to deal with it fully I would require to write a text-book, so that I can not do more in the time at my disposal than simply enter upon a few of the most important points. I have, therefore, thought it advisable, instead of entering into the details which are usually to be found in ordinary handbooks on the practice of medicine or in special books on cardiac disease, to take up a few points which I regard as the most important and try, if possible, to bring out clearly the general principles of treatment in diseases of the heart and vessels.

It is curious to think that the heart which is beating in the bosom of every one began to beat a considerable while before the body had assumed a human shape, and will, with very few exceptions, continue to beat a short time after the individual has forever become unconscious of this world and all its concerns. During the whole life of the individual his health, energy and activity, his success in life, his physical force, his mental power and even his moral qualities, depend to a great extent on the way his heart performs its duty. Hardly less important than the action of the heart is the function of the vessels, because, even while the heart is beating regularly and steadily, obstruction to some of the cerebral vessels may transform a man who was far above his fellows in physical strength or intellectual power into a helpless paralytic or demented invalid. A study of the means by which the functional activity of the heart and vessels can be maintained or increased is, therefore, of the utmost practical importance. This has been recognized in every age of medicine, and perhaps there is no movement more characteristic of the physician than that of feeling the pulse of the patient. By this simple act the trained finger can discover a great deal regarding the state of both the heart and the vessels, and obtain much information regarding the indications for treatment. Greater perfection in other means of physical diagnosis, and especially in auscultation, have tended to draw attention away from the pulse and direct it rather to the sounds which can be heard in the heart and vessels, so that more thought is now bestowed by many physicians upon actual valvular changes than upon the strength of the cardiac muscle. A little consideration will show that this is wrong. Many men live with serious organic disease for many years and are hardly conscious of it. When I was a medical student, one of my honored teachers had had pericarditis and suffered from great shortness of breath due to adherent pericardium. After a lapse of thirty-five years, during which he has continued to do much good work, he seems now to be much stronger and healthier than he was then. A similar occurrence takes place when the valves are diseased. In his excellent work on diseases of the heart, Sansom says that many who are the subjects of even considerable valvular affections can live a large portion of their lives unconscious that they have any such disease. Balfour states that he has seen many cases of aortic incompetency who have suffered from it from thirty-five to forty years, and an old friend of his had suffered from mitral regurgitation for nearly seventy years, yet lived a useful life nearly all that time, and even at the last, his heart was not the first organ to fail. A medical man whom I used to see had been rejected for life assurance on account of mitral disease, before the Crimean War, and had been told that he had not two years to live. He thought that as his time was short, he might as well see something of the world during it, so he entered the army, served through the Crimean War, saw a great deal of active service afterward, and died only about two or three years ago. These instances clearly show that considerable valvular disease may have little effect in shortening life or producing serious symptoms. But the case is very different when we come to consider the muscular walls of the heart, for any weakness in them not only enfeebles the circulation at once, but will secondarily produce valvular incompetence. The mitral and tricuspid valves are only large enough to close orifices of a certain diameter, and when these orifices become larger, as they do from enfeeblement of the cardiac muscle, the valves are not able to close the auricular and ventricular openings, and regurgitation takes place.

Weakness of the heart is not an absolute, but only a relative term, and however strong the heart itself may be, the limit of its power may be reached. The ancient Greek who carried the news of the battle of Marathon to Athens must have had a very powerful and healthy heart in order to do so, but even he overstrained it and fell dead at the conclusion of his task. The young American who performed a similar feat a few years ago showed himself either stronger or more fortunate than the hero of old, yet he must have felt the unpleasant symptoms of cardiac strain. These symptoms are known to almost every one, because in ordinary people who are out of training a short run to catch a railway train or steamer, more especially if a portmanteau or bag be carried, will bring on tightness and oppression across the chest, rapid, difficult and gasping breathing, giddiness and muscular weakness, so that the person may be unable to stand. In feeble or elderly men these symptoms may be associated with a sense of impending death, and death

indeed may actually occur. In such cases we find that moderate exertion in persons who are healthy but otherwise out of training, produces symptoms similar to those which occur in men of exceptional health and training, like that of the athletes of Athens, after severe strain. But when the heart is feeble and fatty from imperfect nutrition, such as occurs from the chronic abuse of alcohol, or from atheromatous change in the coronary arteries, and especially when the heart thus degenerated has extra work thrown upon it by valvular disease, we find that slight movements, such as that of crossing the room, of getting up, or even of sitting up in bed, may bring on symptoms of cardiac distress similar to those which occur after a run to the train in middle-aged gentlemen, or after a run of many miles in athletes. What I have just said is, I think, sufficient to prove the statement with which I started, namely, that cardiac weakness is a relative term, and expresses the power of the heart, not absolutely, but only in relation to the work that it is called upon to perform. Probably there is not one in a hundred thousand; perhaps indeed not one in several millions of men, however young, strong or athletic, who could at a moment's notice start on a race such as that from Marathon to Athens and run it successfully. In order to do so previous training is necessary, and the science of such training is to accustom the heart to excessive exertion by gradually increasing the work which it has to do, while at the same time the other organs of the body are kept in a healthy condition, so that the heart may receive a proper supply of healthy blood and its nutrition be thereby increased. The best example of training is the classic one of Milo, the wrestler of Croton, who is said to have succeeded in carrying a full-grown bull upon his shoulders by beginning to carry it when it was a newborn calf and continuing to carry it every day afterward. In this way, it is said, the athlete's strength gradually increased in proportion to the weight of the calf. If training, then, be the method of bringing an ordinary healthy heart up to the mark required for excessive physical exertion, the same method ought to be successful in bringing the heart enfeebled by disease up to the healthy standard.

This, I believe, is the truth, and of all agents for remedying cardiac weakness there is none so good as that of training. The training must be adapted to the condition of the heart, and the amount of exercise given to a feeble, fatty heart must be very little indeed, and when even slight movements give rise to cardiac distress, we must insist upon absolute rest. It is sometimes difficult to get this injunction carried out, for active people insist upon getting up and moving about the room, even when such movements cause distress. But here the physician must insist that absolute rest in bed shall be maintained and that the whole strength of the patient shall be devoted to the recuperation of his heart. One good rule is that the heart shall not be allowed to make a single extra beat that can be avoided. If the patient rises in bed his heart will probably beat from five to ten times in a minute more than if he lay quiet, and if it does this for five minutes it has done from twenty-five to sixty beats too much. Sometimes patients will grumble, but they may occasionally be comforted by simply reminding them that their condition is not nearly so bad as if they had broken their thigh-bone, for then they would have been put up with a splint, unable to move for many weeks, and very likely have been suffering pain, while their cardiac disease is producing them no pa whatever. Indeed, I have sometimes threatened p tients to put them up in a long splint, as if they h a broken leg, when I find them rebelling against th enforced rest which is necessary for their recovery. do not think I can speak too strongly regarding th necessity for absolute rest in bed in cases of cardia distress. I often remind patients that they must tre a strained heart as they would a sprained ankle, an remember that just as the least extra movement wi bring on a pain in the ankle, so it will increase th distress in the heart, while each increase still furth prolongs the time necessary for recovery.

But here another difficulty meets us. By keepin the patient so quiet we no doubt lessen the work th heart has to do, but we diminish at the same time th circulation through the stomach, liver, intestines, kid neys and muscles, and we thus tend to a certain exten to interfere with the elaboration of healthy bloo which is required for the efficient nourishment of th heart. Here massage comes in, and when this is ski fully applied, it not only increases the circulatio through the various organs of the body, but whil doing so it gives the heart rather less than more to do For when the patient is left to himself the heart ha to drive the blood onward through the whole circula tion, but when the masseur is at work he moves th venous blood along the veins, the lymph along th lymph spaces and lymphatics, so that his hand i really a kind of accessory venous and lymphatic heart At the same time it actually lessens the work to b done in the muscular arteries, for Dr. Tunnicliffe an I found that massage of the muscles causes the bloo to flow through them much more quickly than whe they are at rest. We see, then, that in the worst case of cardiac distress the chief remedies are absolut rest and massage. But there is a long interval betwee this condition and that of ordinary health, which mus be filled up by gradually increasing movements. Thes movements have of late years received a great deal o attention, more especially from Ling in Sweden, Schot of Nauheim, and others. The essence of these move ments is that they must be slow, gentle, and gradually increased against resistance, that they shall not caus the patient any distress, but only call upon the hear for such work day by day as it is well able to do. Bu before the patient has reached this stage where he i able to take ordinary exercise, another system of treat ment, namely baths, may be employed to assist th action of the exercises. In the treatment which is s successfully employed at Nauheim the baths contai chlorids of sodium and calcium, the proportions being 10 per 1000 of chlorid of sodium at the commence ment, gradually raised to 30, and of chlorid of calcium 2 per 1000, gradually raised to 3 or even 5 per 1000 At Nauheim the waters contain carbonic acid, bu this may be artificially supplied by means of bicar bonate of sodium and hydrochloric acid, or tablets specially prepared for this purpose.

The effect of these baths is to stimulate the skin and increase the flow of blood through it, while at the same time a reflex influence is exerted upon the heart through the vagus, by which the pulse is slowed. It is evident, by dilating the cutaneous vessels, the effect of the bath upon the skin is somewhat similar to that of the masseur upon the muscles; that is, in both cases the bed through which the blood has to flow becomes wider, and the resistance to the action of the heart is consequently diminished. Where the tension

great it may be still further diminished by the use of nitrites or substances having a similar reaction. But the most important effect of the baths is probably a reflex one upon the heart, and perhaps I may make this effect more clear by a comparison with athletic feats. To walk a thousand miles in six weeks can hardly be regarded as any feat at all, but to walk a thousand miles in a thousand hours is a very different thing indeed, and may be regarded even now as beyond the capacity of most men. There is no more actual work involved in walking twenty-four miles in one day than in walking twenty-four miles in twenty-four successive hours, one mile every hour. The difference between the two is the shortness of time allowed for rest and recovery between each period of exertion in the latter. When this time is further shortened, as it is in walking a thousand half-miles in a thousand half-hours, the difficulty becomes incomparably greater. It would probably be almost impossible for any one to perform this feat by walking a mile at the beginning of each half-hour, but in order to increase the interval for rest, one mile is done at the end of one half-hour and the next mile at the beginning of the next. Supposing that a man walks four miles an hour, or what is equivalent to it, one mile in a quarter of an hour, he would only have a quarter of an hour's rest between each successive mile if he walked it at the beginning of each half-hour. But by walking two miles together he is able to obtain half an hour's rest, and it is the prolongation of the rest which enables the man to go through with the feat. Now, the action of the heart is like that of the athlete who has very short periods of rest between his periods of action, and just as the athlete's work is rendered more difficult by shortening his periods of rest, so is that of the heart by increasing the rapidity of its pulsations. For just as the athlete will take about the same time to cover his mile whether he be walking twenty-four miles a day, one mile in each hour, or half a mile in each half-hour, so the heart takes about the same time to perform its systole whether it be acting quickly or slowly. Increased rapidity of the pulsations, therefore, means a shorter time for rest and consequent loss of time for recuperation. The inhibitory fibers of the vagus, which slow the heart, are the nerves which tend to increase its nutrition, and when they are cut through and the heart is allowed to beat more quickly, it is very apt before long to undergo degeneration. It is, therefore, evident that any means by which we can stimulate the vagus and slow the heart is likely to aid us in restoring its power. This is the effect which baths seem to have, and they probably act reflexly on the vagus through the nerves of the skin.

But we have, in addition, various drugs which stimulate the vagus roots in the medulla oblongata or the terminal endings in the heart itself. The number of these drugs is very great, and very many of the arrow poisons and ordeal poisons employed by savages act on the heart in this way.

Among them may be mentioned the active principles of digitalis, strophanthus, erythrophleum, convallaria, adonis vernalis, antiar, tanghinia, hellebore black and green, oleander squill, manganja, carravol, yao and cactus, but among these the most important are certainly digitalis and strophanthus. These drugs not only slow the heart, but they increase the energy with which it contracts. The energy may be still further increased by a combination of strychnin or nux vomica with the drugs already mentioned, for while they appear to act chiefly on the muscular fiber, strychnin exerts its stimulating action on the motor ganglia of the heart. By the combined use, then, of rest, massage, graduated exercises, baths and cardiac tonics, the heart may be brought from a condition of extreme weakness to one of moderate strength.

And then comes in the use of another system of training which is usually associated with the name of Oertel. The essence of this consists in gradually increasing the work that the heart has to do by making the patient walk farther and farther along paths of gradually increasing steepness, so that at the end of the treatment he will be able to walk a considerable distance and up a pretty steep incline. This treatment, however, requires careful supervision, lest at any time the patient overtax his strength, and the supervision should be exercised from day to day, because the health and strength of a man may vary very considerably in two successive days, not from any change in the heart itself, but from changes in other organs, and more especially in the digestive or eliminative organs. Attention to these is most essential in diseases both of the heart and vessels, but to enter fully upon this subject would take me too far, and I must conclude this paper, which I fear is already too long, by simply mentioning the great use of cholagogues, purgatives and alteratives, such as iodid of potassium, in diseases of the heart and vessels, more especially in atheroma, which, by affecting the coronary arteries, leads to disease of the heart itself. The utility of iodid of potassium is very great, but sometimes it must be administered in large doses, and frequently I believe the full advantage is not obtained because the doses are not sufficiently large.

To resume shortly what I have said in this paper, the main risk in cardiac disease is from feebleness of the muscular wall of the heart, and the chief remedy is to lessen the work to be done till it is not excessive even for the most feeble heart; to slow the heart's action so as to give it time for rest, and to train the heart by graduated exercises until it is able to meet all the ordinary, or perhaps even all the extraordinary, demands upon it.

THE USE OF MORPHIA IN BRIGHT'S DISEASE.

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Few opinions are more firmly held or more dogmatically taught than that opium must not be given to patients with albuminuria or Bright's disease. The more extreme upholders of this doctrine teach that the presence of albumin in the urine, even when the kidneys are not diseased, as in cases of fever, prohibits the use of opium. Many years of careful investigation of this subject convince me that this opinion is wrong. I avail myself of this opportunity to again draw attention to this subject. Several writers in America and England have recorded their experiences that opium either by the mouth or hypodermically may be administered, not only without danger but with great advantage, to some patients with uremia. Dr. Loomis ("Diseases of Respiratory Organs, Heart and Kidneys," 1875) states that he has employed morphia

hypodermically in puerperal eclampsia with marked success. He says that morphia may be given hypodermically to some, if not all, patients with acute uremia without endangering life. He states that the almost uniform effect of morphia so administered is 1, to arrest muscular spasm by counteracting the effect of the uremic poison on the nerve centers; 2, to establish profuse perspiration; 3, to facilitate the action of cathartics and diuretics. He has given half a grain of morphia hypodermically to patients completely comatose, with uremia, with benefit. Austin Flint ("Clinical Lecture," *New York Medical Journal*, reported in *Medical Times*, April, 1880) states that uremic convulsions in connection with hard contracted kidneys are well treated with hypodermic injection of morphia. There is no question in his mind, he says, that the administration of morphia in pretty full doses is of considerable service in quite a number of cases of uremic poisoning with nausea, tremor, impaired vision, etc. Roberts Bartholow ("Treatment of Diseases by the Hypodermic Method") asserts that in the treatment of uremic convulsions considerable doses of morphia are demanded; to an adult half a grain may be administered at once, and repeated so that as much as two grains may be injected within a few hours in severe cases. Stephen Mackenzie (*Lancet*, Aug. 3, 1889) reports some cases of uremia treated with hypodermic injections of morphia. One patient with paroxysmal dyspnea, with weak heart was relieved by one-sixth of a grain of morphia. Another case with breathlessness, irregular action of the heart and headache was greatly relieved by the same treatment, the patient obtaining refreshing sleep the first time for a long period. He has benefited patients with renal asthma by hypodermic injections, also removed headache. He refers to two cases reported in the *British Medical Journal*, March 16, 1888, suffering from uremic convulsions, both of whom recovered after the hypodermic use of one grain of morphia. Robert Park (*Practitioner*, Vol. xxiv, 1880) recommends this treatment in uremic insomnia and orthopnea. Powell (*British Medical Journal*, 1885) injected one-twelfth grain of morphia into a child 6 years old suffering from uremic convulsions, due to acute nephritis, following scarlet fever. The convulsions subsided, there was no recurrence and the child recovered.

Osler writes concerning uremia, "for the restlessness and delirium morphia is indispensable. Since its recommendation by Stephen Mackenzie in uremic states, some years ago, I have used this remedy extensively and can speak of its great value in these cases. I have never seen ill effects or any tendency to coma follow." My observations entirely confirm these statements, and yet the use of morphia in Bright's disease is denounced with little less than horror by most practitioners, though they all confess that they have never tried it, that, indeed, they dare not do so. Morphia hypodermically employed is of conspicuous benefit in the shortness of breath of uremia. This may be due to different causes. With some patients the compensatory hypertrophy gives way and they suffer from cardiac dyspnea, in all respects similar to that from valvular defects with insufficient compensations, notably, sleep in aortic regargitation. The paroxysmal shortness of breath prevents sleep; on falling asleep they are soon wakened by distress of breathing. The patient is compelled to start up in bed, often throws his legs out of the side of the bed panting for air, or the sleep may be distressed and harassed by Cheyne-Stokes breathing. This distressing condition, whether due to deficient compensation, in Bright's disease or to valvular defects, is almost invariably relieved by hypodermic injection of morphia, and several hours' refreshing sleep are secured, to the great relief and comfort of the patient, who on the following day is refreshed, takes and digests and assimilates his food better. Morphia can scarcely be too highly commended in such a condition, and although it does not cure, it delays the end and greatly lessens the distress of the declining days of life.

Uremic asthma, again, yields promptly to hypodermic injection of morphia. On the other hand, persistent distress of breathing may be due to dropsy, the lung being hampered by an abundant serous effusion into the cavity of the chest. I need hardly say that such a condition is not improved by the use of morphia.

The headache and sleeplessness occurring in uremic patients can generally be removed by the hypodermic injection of morphia. I have not given this treatment in uremic convulsions or coma, but I have largely used it in many cases of uremia with other troubles, and am sure that morphia may be given to such patients with every prospect of benefit and no risk of harm.

THE PLACE OF HYDROCHLORIC ACID IN THE TREATMENT OF DISEASES OF THE STOMACH.

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The time has come for a definite and precise statement of what hydrochloric acid can do in the treatment of stomach diseases—when and how it is useful, as well as when and how it can be harmful. Riegel, in his recent work[1] very pertinently remarks: "While formerly HCl was prescribed in nearly all dyspeptic conditions, its employment has of late been essentially limited, since it has been recognized that it is by no means true, as was once assumed, that in almost every form of dyspepsia a lack of HCl exists." There is much other testimony to the effect that even among the aggravated stomach conditions for which the advice of a specialist is sought, an excess of this acid is very often found in the gastric juice. Could all cases of gastric derangement, including the earlier stages of catarrhal affections, be brought to the test of a chemical analysis of the stomach contents, it is probable that those with either a normal or excessive secretion would be largely in the majority. And none of these require the administration of HCl as a medicine. Indeed, it is capable of doing pronounced harm in all such cases. We should expect, a priori, that to introduce this active drug artificially into stomachs which already secrete it in too large quantity, would intensify the depressing and painful symptoms of hyperchlorhydria. Experience has abundantly shown that this result usually follows in such cases when the drug is administered in considerable doses.

The well-known antiseptic power of HCl might tempt one to give it in the numerous cases in which, despite the presence of a normal percentage of this

acid in the gastric juice, the patients suffer from eructations of gas as a result of fermentation in the stomach, and (as still more frequently happens in cases with a normal or over-abundant secretion of gastric juice) are plagued with a large amount of intestinal flatulency. Indeed, this remedy is administered every day by excellent physicians in these conditions, not after having actually learned through a gastric analysis that a full proportion of HCl is secreted, but upon a venture, assuming that there may be a deficiency, and if not, that in any case the drug is antiseptic and must do some good. Just here is where the mistake is made. To administer HCl in cases in which it is not deficient, is not only to do no possible good but generally to do harm, and for these reasons: This drug, as has been pointed out by the writer in previous papers,[2] acts even in small doses as a decided stimulant to the gastric glands, and when long continued rarely fails to increase largely their activity, except in gastric atrophy or cancer. This property, which renders it so useful as a remedy when the gastric juice is insufficiently secreted, becomes a cause of injury in the opposite condition. Therefore, HCl taken into a stomach already supplied with it, and the stomach contents after meals being thus as acid as nature intended them to be, must not only produce at the time an excessive degree of acidity with all the harmful results, especially to digestion in the small intestine which this implies, but if administered often enough may easily set up a more or less permanent hyperchlorhydria.

But it may be urged that we might well risk some over-acidifying of the gastric juice and the resulting impairment of intestinal digestion, if by this means we can lessen fermentation in the stomach. Unfortunately, however, in the cases in which there is no deficiency of HCl, very little, if any, antiseptic action can be demonstrated as a result of its administration. In the acid gastritis described by various authors in Germany and France, and especially in recent treatises by Hemmeter[3] and VanValzah and Nisbet[4] in this country, a condition which my own experience has shown to be very common and the one most often present, when a normal or excessive proportion of HCl is found associated with much fermentation, the gas forming bacteria seem to acquire a tolerance for the HCl and to thrive in spite of it. At all events, the fact that even a very great excess of HCl in the human stomach does not prevent fermentation, has been made familiar to the writer by a large number of observations. Riegel has lately called attention to it without attempting to account for it. In his work already referred to, he says: "That the presence of free HCl in the stomach contents is no hindrance to the development of an abundant gaseous fermentation, is a long since established clinical fact, which through the researches of Kuhn and Strauss has been given a further support. It has been proved that the HCl of the gastric juice under the existing conditions has absolutely not the disinfecting properties against the yeast fungi which has been established, for it is in a pure solution of the drug, or in artificially prepared gastric juice, but on the contrary, the view always maintained by us has been confirmed, that when stagnation exists the preferred soil for the gaseous fermentation is afforded by just those cases which show a normal or over-large amount of HCl." Some experiments recently reported to the Hospital Medical Society by Toinot and Brouardel and published in the *British Medical Journal*, show that the bacillus coli can be made to acquire a tolerance for arsenious acid even in strong solutions. They succeeded in training this bacillus to grow well in bouillon containing three grams to the liter of arsenious acid. Then why may it not be that bacteria in the stomach gradually become accustomed to the presence of HCl until finally even a large excess of it does not affect them? At all events the gas-forming micro-organisms are found to flourish in the stomach even when there is present a very large excess of HCl; and in these cases when they have become chronic, it is the rule to have grievous complaints of flatulency, both gastric and intestinal, with an endless train of nervous symptoms, including especially mental depression and insomnia, along with usually constipation.

What has already been said as to the contra-indications for HCl tells in a large measure where and how it can be helpful in the treatment of gastric affections. There are a few prominent gastro-enterologists who seem to place little reliance upon this drug in any case, but the writer has found it of exceeding value, not only as a palliative in cases of atonic dyspepsia, but also as a reconstructive tonic in cases of chronic gastric catarrh, which have not yet progressed to entire atrophy of the glands. In fact, the results which have followed its administration in my practice (usually in combination with pepsin) fully warrant me in assigning to it in the therapeutics of all stomach diseases characterized by hypopepsia (except cancer and atrophy) a place second only to diet and the mechanical treatments, including especially abdominal massage. My note-books contain the histories of a large number of cases in which the administration of HCl for from one to four months, more or less continuously, has been followed by a most notable and apparently permanent increase in the secretion of the gastric glands. In the majority of my cases massage and the use of pulleys or other suitable exercise for the strengthening of the trunk muscles, were also employed as a regular part of the treatment, and the results in these can not be cited as proving the efficacy of any one of the curative measures relied upon. The cure of the patient having been naturally the first consideration, the treatment has not been limited to any one agency, no matter how valuable. A large amount of evidence has thus accumulated which, it must be admitted, is inconclusive in so far as concerns the relative value of the various remedies used.

But, fortunately for the purposes of this paper, some of my hypopeptic patients found it impracticable to take massage, and at the same time unable for various reasons to carry out with any regularity the directions as to methodical exercise, and the marked gain in digestive power acquired by these must be credited mainly to the medicine taken.

Wegele[5] and Hemmeter[6] among recent authors bear witness to the powers of HCl as a stomachic or stimulant to the peptic glands. Hemmeter also quotes Riegel, Reichman and Mintz as having reported cases of achylia gastrica in which the restoration of the secretion of HCl was effected by a more or less prolonged dosage with the same acid. Hemmeter gives 20 drops of the diluted HCl in appropriate cases in two ounces of water every half hour, beginning fifteen minutes before meals and continuing it till half an hour after the meal. He has frequently seen excellent results from this method, and believes that the motor function of the stomach is favorably influenced

as well as the glands, a view which my own experience confirms. My practice has been to give much smaller doses. I direct the patient usually to begin with a dose of four or five drops of the dilute HCl given after each meal in this way: The amount prescribed, which is gradually increased, if necessary, up to ten, or exceptionally even to twenty drops, is added to half a goblet of water, which the patient is directed to take in small sips at frequent intervals during an hour or hour and a half. In cases of complete or nearly complete anacidity the sipping of the diluted acid is begun immediately after the meal, but in other cases not till the meal has been over for half an hour. In this way the amylaceous portions of the food are given time for the action of the saliva. I was led to adopt this gradual method of administering the acid through having observed a number of cases with absence of free HCl in which the patients complained of a marked burning in their stomachs after taking quite small doses of the remedy. This apparent intolerance of the drug was overcome entirely by having it taken gradually in small sips, and the results eventually were quite as gratifying as in other cases in which no such disagreement had occurred. Except in those cases where in spite of deficient or absent HCl secretion there had been demonstrated a normal proportion of pepsin or of pepsinogen, I have usually combined with HCl a moderate amount of a good preparation of pepsin in the form of a glycerole. When owing to the exigencies of a busy practice the quantitative tests have included the total acidity and amount of free HCl only, pepsin has generally been added to the mixture, and the very large proportion of such cases in which the digestive power has decidedly increased insomuch that the patients, after a time, were able to do without stomach remedies, has led me to suspect that these doses of pepsin may, like HCl itself, exert a real curative influence, acting to some extent as a stimulant to the cells which secrete pepsinogen. In the cases, reports of which are given below, no very severe restrictions of the diet were imposed, though hot or fresh bread, fried articles, sugar, nuts, vinegar, the sourer fruits, especially uncooked, and shellfish, except oysters in their season, were excluded, and the patients were enjoined to eat slowly, using their saliva to moisten all starch foods, and to drink either nothing or very sparingly at meals.

Case 1.—Lady aged 36, resident in New York, while on a visit to Philadelphia, came under my care on account of chronic indigestion with much fermentation, constipation, anemia, irregular menses, impaired sleep and cardiac palpitation. She gave a history of having suffered in a similar manner for several years, and of having had more or less trouble with her stomach for twelve years. Had formerly had much pain after meals, and for this had been directed to take freely and continuously tablets made up mostly of sodium bicarbonate about 5 grains in each. She began by taking one every hour, or 16 a day, but finally reduced them to 8 daily. These were continued with little or no medical oversight for three years, until they markedly disagreed by causing nausea. External examination when this patient came under my care in December, 1896, showed the right kidney to be loose and very movable and the stomach dilated, extending from the normal limit above to several inches below the level of the umbilicus, with tardy expulsion of the contents. The liver area was somewhat smaller than normal, but the other organs presented nothing abnormal. Analysis of the stomach contents after a test breakfast, showed a total acidity of only 24, and an entire absence of free HCl. Rennet test, no result in twelve hours. Indican in excess in urine. My first prescription contained in each fluid dram 10 m. of dilute HCl with 15 m. of glycerole of pepsin, 1¼ m. of Tr. Nuc. Vom. and ½ m. of carbolic acid. A teaspoonful was added to half a glass of water and beginning half an hour after meals the patient sipped the entire solution during the hour following. Shortly after beginning treatment she was attacked with a severe diarrhea, which necessitated a different line of medication for a week or more. Then a new digestive mixture was given with the dose of HCl reduced one-half, and the other ingredients except pepsin omitted.

February 25, 1897, the patient came on from New York and reported improvement in nearly all ways. She had continued her last mixture. The stomach analysis now showed T. A. 40 and free HCl .0146. Less fermentation and better sleep. No excess of indican in urine. The pepsin was now left out of the HCl mixture and a few drops of carbolic acid were again added to it. Massage of the abdomen was tried but proved too exciting to the menstrual function, the first treatment having brought on the flow out of time and in excess. Since the above date the patient has seen me at long intervals only. October 7, 1897, she came on to Philadelphia and reported that she had continued the HCl mixture until six weeks previously, and considered herself then practically well. She had gained 12 pounds in weight, presented a good color and clean tongue, and had lost most of her symptoms except the constipation. She afterward fell ill with grippe in New York and came under the care of Dr. Lockwood in that city, on account of this disease and its complications. She was confined to her bed or her room there a large part of the winter, but at the end of it all her physician wrote me under date of March 28, 1898, that a gastric analysis showed total acidity 50; free HCl 22 (equal to .080) and combined HCl 22. She reported herself to me again April 4, 1898, and looked well considering her recent long illness. There was improved gastric motility, but her stomach was still greatly enlarged, she having declined intragastric electricity and abdominal massage, the two surest remedies for that condition.

Case 2.—Lady, aged 40, wife of a physician in a neighboring city, consulted me March 22, 1897, on account of paroxysmal attacks of indigestion, from which she had suffered for twenty-six years. They were characterized by violent eructations of gas, and seemed to be caused by some unusual emotion or excitement. Formerly they occurred once in several months, and were not followed by any specially unpleasant consequences except nausea and some feeling of oppression. But within the last two years there have been three serious attacks of the kind, which were followed by colicky pains and jaundice, with pruritis lasting a week. These attacks also followed some marked nervous shock or emotional excitement. One occurred just after her father's death. Between times she is said to have had usually fair digestion, with no pain or discomfort after meals and very little eructation. Her bowels have been fairly regular as a rule, but she is very constipated always at the time of the attacks. The latter, of late, have sometimes recurred every day for several weeks, accompanied by severe colicky pain and vomiting. Ingesta taken two or three days before have occasionally been vomited. Color pale and looks dejected. Physical examination: Lungs and heart normal. Liver enlarged. Stomach, slight displacement downward along with atonic dilatation. The upper boundary was one to one and a half inches too low, and the lower boundary between two and three inches below the level of the umbilicus. The kidneys not palpable. No tumor. Gastric analysis after test breakfast: T. A. 12; free HCl entirely wanting. Small amount of mucus. Diagnosis: Chronic catarrh of the stomach and duodenum. Prescribed: ℞ Tr. Nuc. Vom. ƒ℥ii; Ac. hydrochlor. Dil. qs. ad. ƒ℥i. Sig. 10 to 15 drops in half glass of water after meals. Diet to be as nonfermentable as possible. Two months later patient reported improvement. No further attacks. August 6 of the same year her husband reported that she had been obliged to continue the mixture regularly. Every attempt to omit it was followed by a return of indigestion. October 14. Patient recovered a few days ago from one of her severe attacks, which lasted two weeks with eructation, pain and constipation. Gastric analysis: T. A. 18; free HCl none; mucus very small amount. Prescribed: ℞ Ac. hydrochlor. dil. ƒ℥vi; glycerol pepsin qs. ad. ƒ℥ii. Sig.—Ten drops in half a glass of water half an hour after meals by sips. Every other week to take the following: ℞ Argent. nitrat gr. x; Ext. taraxaci ʒi. M. et ft. pil. No. lx. Sig.—One after each meal. April 21, 1898. Has taken both medicines as above ordered—the HCl mixture continuously and the silver half the time. She now has a good color and is very much stronger. No further attacks. Gastric analysis: T. A. 40; free HCl .041; mucus a small amount. The lower border of the stomach was found to be near the level of the umbilicus.

Case 3.—Lady, a teacher, aged 25, referred by Dr. Samuel Bolton of Philadelphia, October 6, 1897. Her chief complaint was headaches and vomiting every few days, with much nausea and occasional vomiting, especially evenings, between the attacks. There was also stubborn constipation and feeling of

ad in her stomach after meals. Organs generally found ealthy except stomach, which was moderately dilated, extend- g down to half an inch below the umbilicus, with delayed ptying. The gastric analysis showed only a very small mount of free HCl (.014) though the T. A. was 66, represent- g largely fermentation products. There was much mucus in e stomach. I advised lavage and the combination of HCl d pepsin as the main treatment. On account of marked arch indigestion, she also took Taka-Diastase for a time, and oncegno Water was taken for some weeks to bring up the uality of the blood.

On April 9, 1898, I found the stomach much retracted in size, e lower border being one and a half inches above the um- ilicus, and the gastric analysis showed T. A. 56; free HCl 05; mucus a very small amount. She had had no severe eadaches with vomiting for three months, and had regained a ormal color, though her gastric catarrh is not yet entirely well.

Case 4.—Gentleman, aged 66, consulted me July 21, 1897, in tlantic City on account of chronic indigestion, from which e claimed to have suffered nearly all his life. Painful accu- nulations of gas and obstinate constipation were prominent eatures. The external physical examination revealed nothing bnormal. Gastric analysis: T. A. 16; free HCl wanting. Starch digestion good. Mucus very small amount. He was laced upon HCl and pepsin in the usual way. He has since een me several times on account of his wife, but reported that e himself was doing so well on the digestive mixture as not to equire any further medical assistance.

December 16, he was seen and was then feeling well. On April 22, 1898, his wife called to consult me for herself and re orted that her husband had been continuing his HCl and epsin, though less regularly, having virtually recovered his ealth. He had taken no other medicine except a little nux omica during the first few weeks and a laxative at night. He ad not had massage except such kneading over the abdomen s he had been able to give himself.

In this case no opportunity has been offered of testing the stomach contents again, but it is highly probable, from the decided improvement in the patient's digestion as well as in his general health, that the gastric glands are now doing much better work.

Reports of a number of other cases might be added in which under a treatment consisting either entirely or mainly of the administration of HCl and pepsin, conditions of apepsia or hypopepsia improved more or less markedly, the gastric secretion having returned to the normal. Without claiming that such fragments of clinical experience can be accepted as demonstrating beyond question that HCl stimulates the gastric glands, it must be admitted that a strong presumption is thus established as to the existence of such an action.

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RECENT THERAPEUTIC APPLICATION OF THE VALERIANATES OF CREOSOTE AND GUAIACOL.

Presented to the Section on Materia Medica, Therapeutics and Pharmacy, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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It can be safely assumed that the marvelous evidences of progress which the world has witnessed during the last quarter of a century in the science of medicine, especially in the department of clinical medicine and surgery, in very great measure may be justly attributed to the discovery of the relationship which exists either directly or indirectly between certain diseases and a comparatively small group of micro-organisms which are now known to be pathogenic. Out of this application of bacteriology or microscopic botany to the practice of medicine has been developed our present aseptic and antiseptic methods of wound treatment and also our therapeutics of many infectious diseases. The knowledge that we now have of the causes of infection in wounds we owe to the genius of Lister, who has taught us also how we may securely guard against suppuration and other germ-induced pathologic conditions. Similarly Pasteur, Koch, Klebs and others have not only enlarged our sphere of information as to the nature of many diseases to which mankind is liable, but have also clearly indicated the only means of preventing their future progress by isolation and disinfection.

Sepsis therefore occupies an important position in the mind of the clinician, and in consequence, imperative demand has arisen for a class of remedies known as antiseptic agents on account of their ability to counteract the pernicious activity of pathogenic micro-organisms. The chemists have been diligent in their investigations and have placed in the hands of the therapeutist powerful weapons to be used in the warfare between the human body and the invading hosts of disease-breeding cocci and bacteria.

We must not fail to recognize and fully acknowledge the important rôle played by the white blood corpuscles in protecting the human organism from infection; without such natural antiseptics the human race would have disappeared many centuries ago. The aim of therapeutics in this class of diseases is to aid in the battle between the leucocytes and the germs by increasing the functional activity of the former and weakening the virulency of the latter. It is also important to acknowledge the indispensable aid to be derived from hygienic measures in this direction, and especially the great value of sunlight, pure air, and wholesome, easily assimilated food, all of which, from this standpoint, may be regarded as accessory antiseptic agents.

Many of the chemic antiseptics are poisonous to all forms of life, and when these agents are used in medicine it is necessary that we be careful that in our efforts to destroy the bacteria, we do not inflict permanent injury to the patient. One of the most remarkable of our antiseptic remedies and at the same time perhaps, the least poisonous to the human system, is beechwood creosote, which has had an established place in medicine for more than half a century; but as you are aware, creosote has been largely adulterated in the shops and impure carbolic acid substituted, and thus the best results were not at first secured. As a result of Sommerbrodt's efforts on behalf of creosote from beechwood, however, it received greater consideration in the treatment of phthisis, and this interest resulted in our obtaining it finally in a pure state. Creosote being a compound of various elements, chiefly guaiacol and creosol, it was thought by some that more favorable results might be obtained from the principal ingredient, guaiacol, and this was isolated and used with results known to all. In these remedies we found prompt antiseptic and germicidal properties with less poisonous effects upon human beings than from the common phenol or carbolic acid, which in the early day of Listerism was the most prominent among our antiseptic agents. Guaiacol has also become widely known through its remarkable power of reducing temperature when applied to the surface of the body, which discovery is due to Sciolla.

This brings us to the consideration of the newer of the many derivations or compounds of creosote, the valerianates of creosote and guaiacol, for brevity denominated eosot and geosot. They are nearly neutral

esters, having an odor resembling somewhat that of the English walnut, and boiling under normal atmospheric pressure at about 260 degrees C; are soluble in alcohol, ether and benzine. They are administered internally in coated gelatin capsules, each containing 3⅓ min. and in liquid form either diluted with absolute alcohol and flavored with oil of peppermint, cinnamon or cloves or directly in milk. The dose is from 3⅓ to 9 min. three times a day.

A convenient formula is as follows:

℞ Eosot or geosot, 20 ccm. (fl. dr. v).
Alcohol 95 per cent., 80 ccm. (fl. oz. ii dr. v).
Ol. menth. pip., 0.6 ccm. (gtt. x).

M. Each tablespoonful contains about 12 min. of eosot or geosot. Mix dr. i to dr. iii with plenty of milk and give this dose in three equal parts daily.

It is generally conceded that in the treatment of phthisis, for a decade at least, creosote or its derivatives have given the best results of any of the multitude of remedies lauded, but creosote has been so destructive to the digestive and alimentary functions that but seldom a patient would be found who could continue its use sufficiently long or in large enough doses to produce a lasting or permanent effect. The poor patient would lose his appetite and desire for food and consequently his physical strength and power to battle with the disease. Besides this, there was ever present the depressing and self-conscious factor of his own limitations toward ultimate recovery increased by the never-ceasing gastric distress.

The valerianates seem to meet all the requirements as remedies destructive to this disease without untoward effects. They increase the appetite and weight, relieve cough, hectic and night sweats. The valerianic acid component, by its sedative action on the nerve centers, particularly the sympathetic, enables the patient to enjoy quiet and refreshing sleep as well as a sense of ease and comfort not secured by other remedies. Being eliminated largely by the mucous membrane their bacteriologic effects are quickly apparent when used internally in bronchitis, acute gastritis, chronic gastrectasia, typhoid fever, and intestinal irritation; when used externally in lupus and all purulent inflammations, as well as subcutaneously in glandular enlargements of tubercular origin, in hip joint and other bone complications, and as a spray in all nose and throat affections.

Physiologic action—Providing the amount of acidity of the secretions be sufficient to replace that of the acid in the combinations, the valerianates of creosote and guaiacol would be decomposed in the stomach. The hydrochloric acid of the gastric secretion varies greatly in different people as well as in the same patient from day to day and as the estimate is made before or after meals. There is also a great variation of acidity in consequence of the character of the diet as well as at different periods of the day. All these conditions must be considered in determining to what extent a combination will be separated into its several constituents in the stomach; hydrochloric, being the stronger of the acids, would under certain conditions replace the valerianic acid or have the effect of decomposing the combination of the valerinate, thus releasing the creosote or guaiacol in the stomach, but such a degree of acidity would very rarely occur, and without an abnormally large amount of hydrochloric acid one would not find the decomposition take place there, but that the remedy would pass on into the intestines and upon encountering the acid antagonist, alkalinity, would then and there be resolved into the two constituents, guaiacol or creasote and valerianic ac... This would be the usual method, but it might occ... that the alkalinity of the intestinal secretions wou... not be of sufficient degree to decompose a compoun... especially if the remedy were of a character to res... its action. This would occur to a greater or le... extent with a combination whose constituents we... chemically firmly fixed. The more stable the comb... nation the more surely would a greater or less amou... escape in the feces unchanged. It is not at all prob... able that this decomposition is brought about by th... ferments or the products of fermentation, as has bee... claimed necessary for the decomposition of the ca... bonates of creosote and guaiacol, but that the reme... dies would act largely in the alimentary tract as the... do in the test tube, due allowance being made f... slight variations not likely to be material. If the lib... eration of the several components depended upon th... products of fermentation alone, or even to a qui... considerable extent, we would not be able to secur... the germicidal effects of the creosote or guaiacol i... organs or tissue remote from the intestinal tract as i... phthisis, for the creosote or guaiacol having once ren... dered the intestinal tract aseptic it would remain s... for a considerable time, and if the remedy were co... tinued it must necessarily pass on through unchanged... not encountering the products of fermentation neces... sary to decompose it.

This theory can not be reasonably assumed, fo... clinically we know that the creosote or guaiacol ca... be pushed to such an extent as to completely saturat... the organism. It has been claimed that the extreme... volatility of the valerianates admits of their absorp... tion directly into the circulation as the valerianates... and without the necessity of a chemic action; that... they are separated into their component parts after... entering the circulation by the alkalin constituents of... the blood, as is evidenced by the odor of creosote or... guaiacol so quickly appearing upon the handkerchiefs... of those using them for coryza. This property is of... great advantage, as it is apparent that the patient... would thus be quickly under their influence without... the necessity of chemic changes in the intestinal tract... to prepare them for absorption by a decomposition... necessary in the more stable compounds such as salol,... resorcin, the carbonates, etc. To this property may... be attributed the small doses necessary when com... pared with other remedies, as the whole of the valer... ianates is utilized.

As regards the rationale of the action of guaiacol,[1] it has been found that "the beneficial effect of guaiacol in tuberculosis is chiefly due, not to any direct action upon the digestive organs or the blood, but to its combination in the blood with the albuminous bodies (toxalbumins) derived from the growth of the bacilli; that the absorbed guaiacol combines with these products and renders them harmless, and that they are further changed by oxidation, the guaiacol being liberated as a salt of ethyl-sulphuric acid, and the other decomposition products being eliminated in the urine. The products of the bacilli bring about the fever sweating, disordered digestion, etc., and with their destruction the ill effects pass away." This appears a very probable explanation and it is evident that an organic compound such as the ester of valerianic acid, which is quickly and easily decomposed, yielding nascent guaiacol in a condition ready for immediate absorption into the blood-vessels, is the most efficient

[1] Berliner Klinische Wochenschrift, Jan. 18, 1892.

nd economical method of administering this invaluble remedy. It would also seem that this is the best orm in which to give guaiacol in the treatment of yphoid fever and other intestinal disorders.

The clinical results obtained with the valerianates f creosote and guaiacol may be summarized as ollows:

Dr. Rieck, Bassum, Germany, has an article in the August number of the *Medizinal Zeitung* of Berlin, August, 1897, on the valerianate of guaiacol in the reatment of tuberculosis which shows the following esults: Of seventy-six cases treated in the various tages and forms of tuberculosis, he reports thirty-one ures, and thirty-two of the remainder so much improved as to have almost reached complete recovery; ineteen of the thirty-two giving up all treatment because they felt perfectly well. There were eight fatal ases in the whole number treated; rapid and extensive estruction of the lung three; cerebral tuberculosis wo, and general tuberculosis three. The Doctor says hat during his whole experience he has never been ble to obtain results which even approximated those reated with the valerianate of guaiacol (geosot), ot only in tuberculosis but in bronchitis, especially f children, in broncho-pneumonia, catarrh of the ronchi, larynx, pharynx and nasal passages; in acute astric catarrh and in bone tuberculosis by injection irectly into the bone tissue, and finally in lupus. In he cases of catarrh of the apex treated, twenty-four n all, there was quick and permanent relief, night weats disappeared, sensitiveness to atmospheric hanges lessened, weight and appetite increased and he cough was reduced to an occasional evacuation of ucus which soon became less tenacious and was easily ejected. It acts pre-eminently upon the mucous embranes and is therefore useful in diseases of the tomach, intestines and the respiratory passages. It is especially a remedy for tuberculosis, producing no rritation whatever, but in a few days bringing a feeling of comfort and ease.

Dr. W. Zinn of the "Second Medical Clinic University of Berlin," known as Professor Gerhardt's Clinic, published in *Therapeutische Monatschefte*, Berlin, 1898, a communication entitled "Further Results with the Valerianate of Creosote (eosot)," in which he states that: "Dr. Grawitz reported in the *Therapeutische Monatschefte*, Berlin, July, 1896, thirty-five cases of tuberculosis treated with the valerianate of creosote (eosot) as well as a number of stomach and intestinal disturbances, stating that the remedy was taken in all cases without ill effects to the digestive functions. I have now to report that since the publication of Dr. Grawitz's article we have treated eighty more cases of tuberculosis with the valerianate of creosote. As a rule, the remedy was given in capsules, each containing $3\frac{1}{3}$ min., one or more capsules three times a day. In several cases the medicament was continued for several months. It was used in all forms of tuberculosis and it was especially noted that there was in no case disturbance of the gastro-intestinal canal. It is accepted that of all the many remedies which have been recommended for tuberculosis the beech-wood creosote alone retains a prominent place notwithstanding its use has so often been productive of disagreeable effects. The valerianate of creosote is therefore worthy of especial mention because of its freedom from these disturbing influences. Particularly in the early stages of tuberculosis the eosot will be found of great service. Finally, according to the experience had with the eosot in the Gerhardt Clinic, we can say that it fulfils all the requirements of a reliable preparation which can be taken and well borne for long periods."

Dr. Frank Woodbury of Philadelphia, in a paper read before this Association at its meeting in Philadelphia last year, reports having used the valerianate of guaiacol in full strength and diluted with liquid albolene as an anesthetic in nasal operations, as a substitute for cocain, and found it to possess decided anesthetic effects, slower in appearing than from cocain and not followed by secondary hyperemia. The antiseptic power is also of great value in throat and nose operation. In painful affections of the skin attended by hyperemia the guaiacol valerianate relieved pain and checked further pus formation. Small compresses wet with the guiacol valerianate applied over the painful spot afforded almost immediate relief in neuralgias. Dr. Woodbury "also found the valerianate highly useful in erysipelatous conditions, in rhus poisoning, in acute and chronic rhinitis, in all inflammatory conditions associated with or producing fermentation, when administered internally."

In Langsdale's *Lancet* for March 1898, I find a report of three cases of phthisis by Dr. C. F. Wainright, Professor of Clinical Medicine, University Medical College, Kansas City, Mo. I quote Dr. Wainright: "In each case treated, tubercle bacilli were detected in the sputum." I venture to make a brief abstract of these clinical reports:

Case 1.—Man, 32 years of age. With tubercular antecedents. The disease of lung was of two years' duration and attended with usual symptoms, fever, chills, loss of flesh, night sweats, cough, etc. Upper portion of right lung consolidated and left upper lobe partially. Five drops of geosot (valerianate of guaiacol) was given every four hours and continued with very little cessation for five months. The patient at last report had resumed his daily occupation, was coughing very little, temperature had been normal for a month or six weeks, he had gained ten pounds in flesh, the consolidation had gradually lessened and he was apparently on the way to complete recovery. No other medicines had been used in this case.

Case 2.—A man in first stage of acute tuberculosis. Had been sick only five or six weeks. The lower lobe of left lung was consolidated and there were also signs of pleurisy. The usual symptoms were manifested, loss of flesh, night sweats, anemia, indigestion, diarrhea, cough, and sometimes bloody expectoration. Eosot was given commencing with two drop doses, gradually increased to eight drops four times daily in milk. This was continued three months and the patient gradually improved but had not yet fully recovered.

Dr. Wainright "believes that this man's life was saved by the remedy, as from all appearances he would have died in a few weeks had not the eosot been given."

Case 3.—A young lady 16 years of age, mother dead of tuberculosis, had two or three years previously suffered with tuberculosis of the shaft of the tibia requiring surgical treatment. She developed a tuberculous process of the left apex which in four or five weeks had consolidated the entire upper lobe. Guaiacol, creosote, oil of cloves and other remedies were tried and had to be abandoned on account of great irritability of the stomach. She was then given the eosot (valerianate of creosote) in capsules, and after four weeks, when the fever had subsided, she removed to New Mexico, and by the influence of climate together with the eosot which she has taken constantly she is now doing well.

Dr. Wainright concludes: "I have reported these cases, they being typical of many cases I have been treating. Am using these preparations extensively in other cases and have had uniformly good results."

The valerianates are being used at the Loomis Sanatorium for Consumptives, Liberty, N. Y. Dr. Stubbert, the physician in charge, in an article published in the *New York Medical Journal*, April 2, 1898,

says that "geosot, valerianate of guaiacol, proved an agreeable form of administering guaiacol. It was found less irritating to the stomach than creosote." I have very little time to refer to other valuable uses of eosot and geosot, such as their value in overcoming irritability of the stomach as in cases reported by Dr. W. E. Anthony of Providence, R. I., where in the nausea of early pregnancy and the sick stomach of Bright's disease of the kidneys they gave prompt relief. Having indicated some of the applications of the valerianates of creosote and guaiacol in clinical medicine and surgery, with one further reference I will close. Surgically Dr. Rieck refers to two cases of lupus of the face cured by applications of geosot and also to two cases of tuberculosis or white swelling of the knee and hip joint cured by injections of geosot into the capsule of the joint. Dr. Rieck also positively states that the valerianate of guaiacol cures bone tuberculosis, though not through the usual channels of absorption but by direct local application and declares that there is no question but that the use of the valerianate of guaiacol will permit of a marked extension of conservative measures in the treatment of tuberculosis of the bones and joints.

THE GENERAL PRINCIPLES OF ALKALOIDAL MEDICATION.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY W. C. ABBOTT, M.D.

CHICAGO.

My purpose in coming before you is to present some of the general principles governing that form of medicinal treatment which I have denominated "Alkaloidal Medication," and I trust that I may be enabled to present them with sufficient force and clearness to make my meaning distinctly understood. I am prompted to this effort by the belief that by bringing the subject before this Section of the great Association, we may correct some mistakes which my experience shows to exist very generally among the members of our profession.

There is an erroneous idea abroad that those who favor alkaloidal or dosimetric medication aim to establish a distinct system of practice. This is a great mistake, and a careful perusal of the literature of the subject will show that the word "system" is used by its opponents while the word "method" is used by its friends. In other words, what we claim for alkaloidal medication is that it is simply an up-to-date method for the treatment of disease, whereby departures from physiologic equilibrium can be controlled more quickly, safely and pleasantly than by any other known method. This claim we base upon the fact that alkaloidal therapy is founded upon the use of remedial agents in a state of chemic purity, completely prepared outside the body for ready absorption, leaving practically no chemistry at all to be performed by the ailing and weakened cells.

The agents we utilize are the active principles of plants—alkaloids, resinoids, glucosides and concentrations—and certain mineral preparations, all in a state of chemic purity. In fact, we use the same remedies we always did, but with the "dirt left out." For convenience in dispensing, these agents are usually given in the form of granules or minute tablets, accurately divided and measured to minimum dosage, to be given at frequent intervals until effect. By this means one is always absolutely safe, utilizing the smallest possible quantity of the best obtainable means to produce the desired therapeutic result. How to obtain this result most speedily, safely and pleasantly should be the study of every practician of our art. The use of these "arms of precision," in cumulative minimum doses, gives us such perfect control of the physiologic disturbance at the beginning of an acute disease that we promptly restore the normal equilibrium, jugulate the attack, and cure the patient before serious organic lesions have been produced. This effect may be secured in all cases depending upon a controllable congestion, such as bronchitis, pneumonia, peritonitis and kindred conditions. Eruptive fevers will pass through their cycle under any form of treatment, but when treated alkalometrically they do so in a mild and greatly modified form; while that class of affections of which typhoid fever may be taken as a type may either be aborted in the early stages or, if seen too late for that, may be conducted through the regular course to a quick and safe termination, like the eruptive fevers. The early control of the congestive element means much as to the subsequent course of any febrile attack, whether it be that of a specific fever or of a local inflammation.

In the practice of alkaloidal therapy certain customs or basal principles have been developed, which though not confined to this therapeutic method alone have become, in a manner, habitual to its followers. Whether or not these principles are well-founded you may easily determine. I will first mention the giving of small doses, frequently repeated, until the desired effect is produced; that is, every fifteen to thirty minutes, according to the severity of the attack, until some improvement is manifest. Such doses should then be given, at greater intervals, as will keep up this effect. By adhering closely to this method it is simply impossible to overdose the patient. In this way the alkaloids and other active principles and the most powerful mineral drugs may be used with perfect safety. Here we have the first illustration of the value of the alkaloids in promoting accuracy of medication. These agents are clean-cut and well-defined in their effects and totally devoid of the uncertainty which hangs over the galenicals. For instance, when we give pilocarpin we direct the dose to be given every fifteen minutes until sweating occurs. We *know* this will be the effect; and no one who has enough intelligence to be left in charge of a patient can possibly mistake so simple a direction. But if we were to give the fluid extract of jarborandi we could not know whether it would induce perspiration or dry it up, because the way it will act depends on which of its alkaloids—pilocarpin or jaborin—happens to be in excess. Consequently we have to go into a long explanation to the nurse, which she is not likely to comprehend, because we do not really know just what effect the medicine is going to exert.

I will not occupy your time in detailing more of such illustrations, but will merely ask you to call to mind the great number of drugs that contain more than one active principle, some of which are antagonistic to the others, as in digitalis, ergot, hyoscyamus, opium, etc. Observations made in India upon the treatment of dysentery with ipecacuanha deprived of its emetin render it probable that many plants not thought to possess but one useful active principle may contain others of no less value. When applied

the treatment of acute diseases, the alkaloidal method directs that active medication be instituted the moment congestion is detected, before sufficient organic lesion occurs to make a specific diagnosis possible, or in other words, it directs that we apply to acute diseases, acute or active treatment, reserving the slow or expectant sort for chronic conditions. There is no such thing in rational therapy as a fixed dose. Under the old methods the dose is modified by sex, age, weight, habit, time, season, general condition and idiosyncrasy—each considered apart from the effect of the disease—therefore, in no instance can the dose be more than roughly approximated to the probable need. The principles governing alkaloidal therapy do away with all this. The initial dose is made too small to do harm under any circumstances; it is given in a shape that allows it to be dissolved and absorbed almost as quickly as if given hypodermically; and it is repeated at short intervals until the desired effect has been obtained.

Here is where individual differences arising from the personal equation are equalized; one will require but two or three doses while another will require ten or twelve to produce the same effect. And it is not impossible that the constant impression of small doses frequently repeated has the same power of controlling acute disease-processes (a power apparently not completely out of proportion to the amount of the agent used) that a film of oil has in preventing the development of waves in an ocean storm. This delicate, scientific handling of a therapeutic agent, especially in the beginning of disease-processes, has its uses; but by no means does it preclude the employment of good, strong, Anglo-Saxon, Dewey blows when they are indicated. There is need of and room for both in the practice of medicine. The researches of Bouchard and the clinical observations of thousands of physicians have demonstrated the importance of a clean alimentary canal, and also the large part played by intestinal sepsis and autotoxemia in the semeiology of most diseases. Accordingly the employment of a saline laxative—preferably a chemically pure magnesium sulphate in effervescent combination—to empty the bowels, and of intestinal antiseptics to prevent microbic action, are inculcated as essential features of the alkaloidal treatment of any disease. By these means the body sewers are flushed; accumulations of toxin-breeding débris are removed or prevented; and the kidneys are relieved from that overwork which, resulting in an irritation, constitutes such a serious menace to the organ, being liable to result in actual and perhaps fatal nephritis.

One of the singular anomalies in medical belief is the persistence of the idea that the alkaloids are dangerous as compared with the galenic preparations from the same plants. But little investigation is necessary to demonstrate the fallacy of this idea. Infusions, tinctures, decoctions and extracts depend for their therapeutic efficacy upon the active principles which they contain, and, in view of the fact that no two crops of the same plant ever contain the same percentage of active principles, they must be present in these preparations in unknown and varying proportions. Not only does the amount of active principle in any plant vary with the seasons, but it also varies with the localities in which it grows and the conditions under which it is cured and kept. Therefore, as usually prepared, each new lot of extract or tincture must be tested chemically or at the bedside before the physician can tell how much he should give. Even the dose of today may not be that of next week; for the drug may deteriorate or, in case of insecurely corked alcoholic or ethereal preparations, may gain in strength through the evaporation of the menstrum. No one can reasonably claim that uncertainty of strength adds to the safety of a dose, nor that the presence of inert matter renders it less dangerous. Besides, as in the case of digitalis, some of the ingredients of a tincture or extract may hinder the absorption of the desired remedial agent, and the most valuable period for medication may thus be lost.

While the old methods deal with uncertainty, the alkaloidal deals with certainty; while the old asks the sick cells to do both chemistry and absorption—when the former can be at best but poorly performed—the new calls for absorption only. Thus a more accurate and scientific therapy is made possible. It is strange that the laity are quicker to recognize the merits of alkaloidal medication than are the majority of physicians. It does not take the patient or his friends long to appreciate the wonderful potency and efficacy of the granules of the active principles, and yet many of the medical profession still fail to comprehend. Occasionally one becomes imbued with the spirit of alkaloidal medication, and, astonished at the excellent results obtained, becomes inspired with a new enthusiasm and awakes to the fact that with these tools he can do better work than he has ever been able to do before. No less an authority than Prof. Shaller says in his "Guide to Alkaloidal Medication": "The writer has had years of experience in prescription writing, and also in dosimetry—alkaloidal medication—and he has no hesitancy in saying that his results with the alkaloidal granules have far surpassed what he was able to accomplish while using the cruder preparations of the same drugs."

Accuracy in prescription requires a corresponding accuracy in diagnosis. The name of the disease is not enough. There must be a distinct conception of the pathologic condition of the organs and the cells and tissues composing them. We must have a clear idea of the nature of the disease and of the treatment required, and administer those remedies which are indicated by the morbid symptoms. The time has come when we should discard the old shotgun prescriptions with which, through the association of a number of substances, the practitioner hoped to at least hit the mark with one of them. The active principles are "arms of precision" and bear the same relation to the old-fashioned galenical preparations that the rifle bears to the shotgun.

The standard works on practice have little or nothing to say of vasomotor spasm and paresis, yet these are among the conditions most frequently demanding the active interference of the therapeutist. Much might be said in elaboration of this subject, the importance of which we are but just beginning to realize; but it must suffice to say that such clear-cut control is just as impossible under the old methods as it is possible and easy under the alkaloidal. Alkaloidal therapy teaches that the treatment must proceed as rapidly as the disease. The more acute the disease the more frequent the repetition of the doses. This statement is almost axiomatic; but it has been reserved for the alkalometrist to recognize it and call the attention of the profession to its importance.

Although I have already referred to the jugulation of acute disease, the prime importance of the princi-

ple involved warrants a further word. I can not too strongly emphasize the importance of instituting a strong, active treatment, directed to the dissipation of the prominent symptoms, at the earliest possible moment of attack, and before the danger has definitely located itself. Otherwise we may be too late, and cerebral, thoracic, or abdominal symptoms may appear, the disease having the form of a fully developed meningitis, carditis, pneumonia, or gastro-enteritis, any one of which must be allowed to go through all its stages unless the patient should succumb before the end. The use of the little granules has led casual observers to ask if alkalometry does not savor of homeopathy. Were it not that the question has been asked by those who ought to know better, I would not occupy your time with this matter; but a few words are enough. The original idea of Hahnemann was that a remedy should be selected whose gross effects coincided with the symptoms shown by the case, and that if properly selected, a single dose would suffice for a cure. The use of the infintesimals was a later development. It was necessitated, in order to hold his followers, by the impossibility of rendering the theory universally applicable when tangible doses were administered. This was one of the earlier applications of the art of hypnotism, and the influence of his "suggestion" obtains to this day. In alkalometry the remedy is chosen that most nearly antagonizes the disease-condition present, and is given in small but effective doses until the drug-effect has been raised to the point where it exactly counteracts the disease-effect; a reaction to the normal is the result. An apparent application of similia may be seen in the alkalometric practice of giving such stimulants as strychnin arseniate and sanguinarin in acute diseases of the parts over which these drugs have a selective influence; but the reason for this is, that there is an antipathic effect to be secured. Disease means a lowering of vitality, either functional or organic. If the vitality of the pharyngeal tissues be normal, pharyngitis will not occur. It does occur, consequently the resisting power of the pharyngeal tissues is below normal Our grandmothers recognized this and treated pharyngitis very successfully with capsicum tea; we, more pleasantly, treat it with strychnin, sanguinarin, etc., or with strong local astringents. This is clearly "antipathic" and not "homeopathic."

The principle of administering a remedy until the desired effect has been secured, simple as it appears, was never satisfactorily applied, or even understood, until the present method was advocated by Burggraeve. This principle is of especial importance in the treatment of children, to whom the giving of anodynes, narcotics or antispasmodics is often a necessary but dangerous measure. No drug, however powerful, need be excluded from child-practice when employed alkalometrically; everything depends upon the accuracy of meeting the indication, and upon the gradation of the dose; all danger is removed by cumulative minimal dosage.

To the superior control which the physician exerts over his drug, to the promptness and certainty of his medication, and to the avoidance of all the ills resulting from the intermediation of the pharmacist, conditions easily possible to alkaloidal therapy, I can but casually refer. The superior facilities for treating emergencies which the physician who carries his granule case possesses over him who has only a lead pencil and a bit of paper; the difference in favor of carrying an ounce of active principle instead of eight pounds of galenical powder (to him who has to carry them), and many other practical points, must be left to you who know them as well as I. When the pathologic conditions that are present in every attack of disease are clearly comprehended, and when the effect of each medicament upon these conditions has been definitely determined, then, and not till then, will therapeutics be established upon a firm basis, and the practice of medicine become a true science. But this happy condition can never be reached until the members of our profession turn to the use of remedies distinct and uniform in their effect. And as alkalometry makes for keener study of disease-states, greater accuracy in diagnosis and prescription, even to certainty as to the dispensing of medicines, it is bound to win in the contest with the old, careless, slovenly, half-hearted, pessimistic methods.

HOW FAR DOES A SCIENTIFC THERAPY DEPEND UPON THE MATERIA MEDICA IN THE CURE OF DISEASE?

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY ELMER LEE, A.M., M.D., PH.D.
NEW YORK.

A large part of medical student life is spent in trying to memorize the contents of the materia medica and its auxiliaries. The drug catalogues sent gratis, and drug circulars and the spurious medical literature for advertising purposes comprise the auxiliaries. Names of drugs are arranged into classes for convenience, and later the names begin to keep company with other names which stand for disease. The hapless student works away for some years till he is prepared to answer examination questions pertaining to diseases and the drugs which it is affirmed cure them, he is then ready to be graduated in medicine, and soon takes up the practice of this acquired information upon other hapless ones, perchance to be found in some eleemosynary institution to which he is assigned for having shown himself specially fitted or judged by his ability to pass a medical examination in current theory and practice.

The ambition of the student is worthy of a better fate than the disappointment which is certain to settle upon him in the battle against disease. He hopes to succeed where others fail, for he does not yet suspect where the real weakness of his therapeutic system lies, believing that failure to cure depends only upon an imperfect individual knowledge of pharmaceuticals and their exact application. Such is the feeling at the inception of the medical career, but later on in the practice of medicine it is realized that the anticipation of a perfect understanding and the possibility of curing where others fail, was a dream.

Schools of medicine rise and fall based upon drug therapy, and the widest dissension exists among adherents of diverse medical systems. Claims are set up which alone exist in the brain of the medical reformer. It is impossible to check thought, as well as undesirable, but it is contrary to progress to accept error. It matters not who is the teacher. The materia medica is a vast collection of strange drugs and chemicals, mineral and vegetable, so put together that they form many thousands of pharmacals, for which there

little use in the arts and sciences, and if the truth ere to be told, even a less need for them in the treatent of disease. The force of habit perpetuates many stoms that are fruitless for good; in the same way e favorite prescription continues to dominate theraeutics without a pretense in many cases of either ience or reason. Man is truly a creature of circumance; physicians operate in precisely the same way a rule. The homeopathic doctor sticks to the otions of his teachers and the precepts of that sysm. The eclectic physician yields to the influence of milar environmental conditions, imbibing a respect d love for the tenents of specific medication as anged for him by the clever but erratic wits of some edical classifier who is taken seriously for an authorty. The great mass of physicians, through an incient of association, make choice of a medical school r study, knowing nothing of its essentials of docine perhaps, choosing it rather for the simple reason at its inducements happen to reach them persuasely. Seeing then that the selection of a creed in edicine is due to some chance circumstance, for the udent can not possibly choose intelligently—for the st of all reasons, that of not having experience—iendly co-operation and not condemnation would be proper attitude toward those who follow sectarianism medicine. One physician of New York prescribes cording to the materia medica on the ground that e knows not what else to do in the treatment of his ses, at the same time admitting freely that his exerience teaches the uselessness of the drugs he preribes. A patient was sent from a famous health sort home to die, with a note of explanation of the eatment of the case during the stay in the sanatorium. here were copies of nine prescriptions included in e notes on the case to further explain to me how the ing condition of the patient had been reached. The octor there had rained coals of literal fire upon her ead. The colleague at the sanatorium possesses all e virtues of fine fellowship, but is a physician emhatically detrimental to his patients. He is one who tands for a class of practitioners waiting with a pharaceutic club to crush a symptom of warning and ossibly kill the patient at the same blow. This is e solemn truth. It is everyday experience.

In another case a dangerous and extensive colitis ad almost accomplished the destruction of a precious ife; my counsel was requested at this stage of the ase. The nurse and family desired me to inspect the edicines, thinking it would aid me. The list of prescriptions and proprietary cures which had been sed in her case awakened my resentment against the edical teaching that made it possible that doctors ould be content to depend upon the materia medica or physiologic reconstruction in the face of such dverse results. The patient was made worse by her reatment, even though the mistakes were made by onest, earnest and faithful physicians. The patient equired a great deal of assistance to re-establish her ealth, but she did not need medicines, either mild r strong.

The study of drug therapy may become fascinating, nd medical experimentation with human life as exiting as a romance, but these things are not the main bject of the true physician. Sound health needs for s continuance a regular exercise of the different arts of the body and adequate nutrition for growth nd repair. When these elemental conditions are not roperly and regularly supplied, it leads to disease. Then the way to cure is to right that which is wrong, using natural agencies rather than artificial. The greatest success in curing the sick is to give scientific attention to such matters as belong strictly to the actual necessities of life forces. The materia medica is not required to support vital functions in health, and the question is: How far is it useful when the body is sick? From time immemorial in the treatment of the sick curative influences have been associated with substances which are not well understood by those who take them. Such long existing habits of man in his course of evolution can not be lightly set aside. In some future day it is certain that drugs and chemicals will form no part of a scientific therapy. This is sure to be the case, for truth is finally certain to prevail. From the physical standpoint the materia medica confers no important favor upon either the healthy or sick body, but as yet the mind of the patient will not listen to the divorce between bodily cure and drug effect, though in fact, the drug actually retards health resumption.

The principal influence or relation of materia medica to the cure of bodily disease lies in the fact that drugs supply material upon which to rest the mind while other agencies are at work in eliminating disease from the system, and to the drug is frequently given the credit. Every physician knows this explanation is in accordance with the facts of the case. Experience teaches that to satisfy the mind of the patient, harmless medicines are fully able to be a substitute for the disagreeable and dangerous ones, besides they confer the real or supposed help to nature and never an injury. Sugar of milk tablets of various colors and different flavors constitute a materia medica in practice that needs for temporary use only, morphin, codein, cocain, aconite and a laxative to make it complete.

If this were not literally true how could the satisfactory cures of the little pill doctors be explained? Their patients are from the most intelligent classes of society, and prefer the harmless doses. The effect upon the confidence is the chief element of such slight drug treatment, while the cure is due to the inherent reconstructive forces of nature, aided by the employment of hygienic counsel.

The multiplication of new chemicals, which are everywhere pressed upon the physician first, then the public afterward, is pretty conclusive that the therapy of this day is not satisfactory, or else physicians are easily imposed upon by the promises of the impossible from the latest drug claimant. It also shows that the doctor is dissatisfied with his standards or loves continual experimentation. If a simple, natural materia medica prevailed in the profession, it would enable the physician to base the cure of disease and his hope for prosperity on selling his wits to the patient rather than the drugs of the apothecary. People everywhere ought, and generally will, pay a greater price for sound counsel than for a prescription for medicines. The strong incentive to excel in medicine is commendable, and should be based upon the desire to be a wise health-counselor, rather than a routine prescriber of chemicals, thus commanding respect and good fees. This is proper and just.

The drug stores are ready to supply a customer with a drug for his every symptom, and for this service they are entitled to commercial profits, but if the physician does no more than the druggist, the public estimate between the two will not be much in favor

of the doctor. The earnings of the profession average low, and so long as practicing physicians indiscriminately prescribe every sort of chemical that is placed before them, they place themselves in competition with druggists and vendors of patent cures, while the original and independent thinker will always enjoy a greater individuality, and deserves to gather the equivalent in fees in exchange for the higher kind of medical aid in the work of a life-saving profession.

10 West 49th Street.

THE REGENERATION OF PHARMACY A VITAL NECESSITY OF SCIENTIFIC MEDICINE.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY OSCAR OLDBERG, PH.D. (NORTHWESTERN UNIV.)
CHICAGO.

Medication is indispensable to the healing art. The physician without drugs is powerless. Indeed, the greater the need of the physician's services, the more urgent is, in most cases, the need of the medicine. The purpose of this paper is a plea for the more faithful and effective performance of duty in the preparation and dispensing of medicines. If medicine is not of importance in the treatment of disease, then let materia medica and pharmacy be abandoned. But if drugs or medicines are really so indispensable that the physician can do little or nothing without them, then it must be one of the highest duties of the physician to give heed to the character of the medicine he employs. This truth is apparently to a great extent ignored. But it is as important to the welfare of humanity as the science of medicine itself. To deny the necessity of faithfulness in the preparation and dispensing of medicine for the sick would be to put the stamp of quackery upon the practice of the physician. I am not an alarmist; but it seems to me that any thinking man must, upon due reflection, be led to the conclusion that the condition of therapy and pharmacy is most deplorable and that there is a present and pressing necessity for a radical change. Sensational references to adulteration, substitution and other frauds in the manufacture and sale of medicines are as ineffective as they are unwarranted. That ignorance and dishonesty are met with in all pursuits is not to be denied. It is not my purpose to reiterate such indictments or too add to the proofs of their truth. But I assert that the vast progress made in pharmacognosy, chemistry and pharmacy has utterly failed to receive that recognition which compels obedience to its lessons. There has not at any other time been a greater disparity between the store of scientific knowledge applicable to the preparation and dispensing of medicines and the actual application of such knowledge for the benefit of humanity. Pharmaceutic knowledge is now sufficiently developed to prove more clearly and conclusively than ever before the necessity for the services of the trained expert in pharmaceutic work.

We now realize fully the fact that without any reference to intentional fraud and criminal ignorance or negligence, medicinal substances are, from other preventable and unpreventable causes, liable to changes and variations such as render it necessary that they be selected, tested, preserved, examined from time to time, and prepared for use only by properly trained scientific-technical experts who are alone competent to determine their character and condition. Whoever dispenses medicines for the sick should know by his own knowledge precisely what he is dispensing and what he is doing. He should possess that special education which is necessary to a proper realization of his full duty and its faithful performance. Yet medicines are now dispensed by thousands and thousands of persons who possess not the slightest knowledge and training in pharmacy. And the most serious feature of this dangerous abuse is the sad fact that a rapidly growing proportion of those who, without adequate knowledge of the risks involved, undertake to provide the medicines required for the sick, are physicians. This practice is indefensible except in cases where the physician is so situated that the services of a competent pharmacist are not within reach. In such cases the physician can only procure his medicines from reliable pharmacists, preserve these medicines properly and renew his supplies so frequently that the chances of deterioration, dangerous alteration or destruction are minimized or obviated.

If modern pharmaceutic chemistry has taught us anything, it is that medicines do not retain their properties unchanged for an indefinite period, and that the changes liable to occur in medicinal preparations are not limited to a mere gradual decrease of potency. They sometimes become nearly or quite inert, and in other cases become so changed as to acquire entirely different medicinal properties. We have heard of such bold-faced frauds as the manufacture and sale of "tasteless strychnin tablets," put forth to deceive those who do not know that strychnin can not be tasteless. We know of proprietary preparations with published formulas which omit to mention very potent actual constituents, but which do name ingredients not contained in the preparations. Against these and other similar frauds the physician has an effective remedy, he can get along without them. But the practice of dispensing medicines which have not been properly examined, the identity, purity, quality and strength of which are unknown, and the age and condition of which are uncertain, must be regarded as a more dangerous evil because of the many plausible excuses which suggest themselves, and because of the fact that the only effective remedy is not so easily found or applied. There are incompetent and dishonest manufacturers of pharmaceutic preparations as well as competent and honest ones. There are incompetent and dishonest dispensers as well as competent and honest ones. Whatever may be the proportion of ignorant and incompetent persons employed in preparing and dispensing medicines, the physicians have it in their power to do more than any other men to compel a thorough and lasting reform in the ranks of pharmacy. The practice of medicine and the practice of pharmacy can not be combined without detriment to both and injury to civilization. The higher the standard of medical education the higher must be the standard of pharmaceutic education also. The more a well-educated physician knows of pharmaceutic chemistry the more clearly will he see the need of the services of scientifically trained pharmacists who devote their whole attention to the laboratory work demanded by modern medicine, including the preparing and dispensing of medicines for the sick. And a well-educated pharmacist should not only be competent to perform these services, but will be sure not to encroach upon the duties of the physician.

The average drugstore is an altogether unfit place

or the proper performance of such important, delicate and responsible duties as those of true pharmacy. But instead of dispensing his own medicines the physician should insist upon a radical reform in the average drugstore, including the banishment of the soda fountain, cigar stand and all other excrescences. Many druggists are uneducated. But the remedy is a reasonable measure of compulsory education which the physicians and the public should insist upon. We have numerous schools of pharmacy, and many of them are excellent schools; but not one of the pharmacy laws of the forty States that have such laws requires a single day's attendance at any such school as a prerequisite to the license to practice pharmacy, because the public and the medical profession are so indifferent as not to demand it. Reputable and honest merchants, called druggists, wholesale and retail, may buy and sell drugs and chemicals about which they know little or nothing, frequently accepting and furnishing in good faith one thing for another. But the only protection against such serious blunders is the faithful application of skill and knowledge by the properly trained pharmacist. Druggists, wholesale and retail, may buy and sell drugs which are so old as to be unfit for use, and those who periodically and critically examine their supplies and throw away all medicines not in perfect condition can be only those whose training fits them to do this intelligently. The remedy must be the just recognition of the plain fact that the pharmacist is a scientific-technical expert who performs special services for which he is entitled to professional fees, and not a mere merchant dependent upon commercial competition.

Without rational scientific pharmacy there can be no scientific medicine, for how can the physician learn anything definite about the action of any medicine which is not uniform? Medicinal preparations must not only be carefully and properly prepared from materials of verified identity and quality, and then standardized; but they must be protected against change, examined from time to time, and thrown away whenever they shall be found no longer perfect.

The new pharmacy should not be a "store," but an *officine*. It should be provided with all the necessary apparatus, reagents, and other facilities for scientific-technical pharmaceutical work, which should include not only the preparation, examination, compounding and dispensing of medicines, but also urine analysis, and other microscopic and chemic examinations required by physicians, the preparation of bacteriologic culture media, etc. There should be no patent medicines and other nostrums in the officine of the new pharmacist, no tobacco, no soda fountain, no merchandise—nothing but legitimate medicines, surgical dressings and whatever else is requisite to enable him to perform his proper functions as the laboratory expert and assistant to the physician and the common chemist of the community. This is no idle fancy picture of an unattainable ideal. It is the reasonable and proper demand of our present civilization. Such pharmacies can be maintained in every large city, and in numerous smaller cities. Not only that, but in places where it may be impracticable to maintain such an officine, divorced from the miscellaneous merchandizing of the average drugstore of today, there can still be a vast improvement made upon the prevailing system.

Will not the members of the AMERICAN MEDICAL ASSOCIATION declare in favor of compulsory pharmaceutic education for the practice of pharmacy and for the divorcement of legitimate pharmacy from the commercial drug business, in the interest of the public welfare?

PRESENT STATUS OF SERUM THERAPY.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY GEO. W. COX, M.D.

CHICAGO.

The history of serum therapy is like the history of a day—a busy day—into which is crowded the memory of a thousand conflicting incidents, all so brief and fleeting in character as to be almost forgotten on the morrow. Many of us remember the "good old days" of thumb lancet and fever starvation, when serum therapy was not even a dream; most of us remember when the clouds first began to separate under the influence of scientific research, and all of us remember when the first sunbeam of actual discovery burst upon the world like a meteor's gleam. It must not be inferred from this that no hint of the underlying principles of serum therapy was ever scented until the present generation, for a suggestion of them was made nearly two hundred years ago, when the Turks are credited with practicing a crude form of inoculation against smallpox. The methods were so imperfect, however, and their success so limited, that the practice was allowed to die out, and many decades passed before Jenner revived the idea and applied it in the form of vaccination. Although another half century rolled by before the next great advance was made, it would be very unjust to the immediate followers of Jenner to say that they were content to confine the principles of vaccination to the prevention and treatment of a single disease. Many theories were advanced by them—the chief one being the once popular but now almost forgotten isopathic practice of the Germans—and much experimentation indulged in; but their gropings were wholly in the dark until a practical application of serum therapy was made possible by the first important discovery of Louis Pasteur.

This great scientist, while still young enough to be addressed as "*mon cher enfant*" by Biot, the discoverer of the phenomena of polarization, taking molecular asymmetry as a cue, had demonstrated the power of the tartrates under certain conditions to deflect polarized light. This led him to the immediate study and speedy discovery of the true cause of fermentation—the real beginning of Pasteur's many and varied achievements. Then followed in rapid succession the numerous and useful ideas now so familiar to every student of medicine, including the explanation of the cause and nature of infection, of contagion, and of the principles of prophylaxis and cure by vaccination. He also determined the evolution of disease germs, both in and out of the living organism; and finally rounded out his brief but fruitful scientific career by giving to the world the new treatment for hydrophobia. Thus by Pasteur was laid the foundation upon which the superstructure of serum therapy is now being erected. I mention this point in simple justice to the inventive genius of a great man.

All great, important discoveries, through their greatness, soon become so popular in the public mind that their originators are quickly forgotten. We speak

of the tubercle bacillus, the telephone and the diphtheria antitoxin as commonplace affairs that had been known from the most ancient times, and rarely stop to think of the men who spent years of earnest toil in their discovery and development. Richet has truly said that the first-course medical student of today is perfectly familiar with many phenomena which the wisest sages of fifty years ago could not understand. Lavoisier, Jenner, Galen, Celsus and Hippocrates all knew that fermentations existed and were quite familiar with their consequences; but they had no more conception of their causation than we of the present day have of the origin and proximate character of electric force. It was not until the year 1857 that the bacterial origin of fermentation was made known and means devised by which it could be produced, controlled or prevented at will. The world of commerce began to be enriched at once, for the wine disease, the beer disease and the silkworm disease each in turn received the attention of the young French physicist, with the result of placing them all under easy control. This would seem to be glory enough for one man, and it seems strange that anyone would bid for more; but the highest reward was yet to come in the application of the same theory in regard to the causation of disease in man. Pasteur was not a physician, and this makes it all the more remarkable that he should have been singled out by the fortunes of destiny to lead the hosts of medical bondsmen into the light of etiologic, pathologic and therapeutic sunshine. Thus, while the whole world acknowledges Pasteur as the "father of bacteriology," as it is known and practiced today, through this relationship he must forever be designated as the *grandfather* of serum therapy. The question naturally arises whether the present progeny is of sufficient merit to be considered a worthy offspring of so famous an ancestry.

There is a brief, uncertain period in the life of every youth, as well as in every young scientific problem, when the weathercock of prophecy seems to hesitate between the points of great usefulness and utter worthlessness. It is the purpose of this paper to show that serum therapy has passed this period of uncertainty and assumed a place among the staples of rational therapeutics. It will be noticed that under the general term of serum therapy I include medication by toxins, antitoxins, blood serum and vaccins—all of which are the outgrowth of the germ theory of disease and the direct result of applied bacteriology. My definition is, therefore, intended to be practical rather than scientific, and I trust the importance of this phase of the subject will be permitted to outweigh technical inaccuracy. In presenting the claims of this new system it is necessary to first point out its great value as a diagnostic agent. The incipient stage of some diseases, tuberculosis for example, is so mild and insiduous that its early detection is impossible by the usual methods; but by means of a bacterial product it may be disclosed, both in man and in the lower animals, even before its location in the organism can be definitely determined. The advantages of this are self-evident. In the human subject it permits appropriate treatment to be instituted before chronicity and complications render the case hopeless; while in the case of cattle it favors isolation or such other disposition of the stock as will insure the owner against pecuniary loss. If, therefore, serum therapy had nothing else to recommend it, its value in the early diagnosis of two such diseases as tuberculosis and typhoid fever would insure it a permanent place in the list of esteemed remedies. But its worth is not measured by its diagnostic power alone. Its well-known action as a prophylactic in some diseases is of the greatest moment, while its curative power in others can be accurately described by the one word "specific."

In the consideration of serum therapy in its practical application to the treatment of diseases, it seems both natural and fitting that the one to be mentioned first and with which all comparisons should be made, is that relentless and loathsome enemy of childhood:

Diphtheria.—To the vast majority of the thinking physicians of today, the mere mention of diphtheria is suggestive of the remedy par excellence in every civilized land—antitoxin. To be sure, there is yet to be heard an occasional denial of the most absolutely demonstrated facts in the common affairs of life. It is not necessary to burden you with a long list of figures and statistics relative to the grand, onward march of success in the antitoxin treatment of diphtheria. The evidence is so overwhelming in its favor, and the few failures and accidents so easily accounted for that but one conclusion is possible to the man whose senses are not wilfully closed to investigation and truth.

Tetanus.—Early in 1894, Carle and Rattone demonstrated that tetanus was an infectious disease, capable of being transmitted from man to the lower animals by inoculation; but it was reserved for Nicolaier to discover the bacillus of tetanus, a few months after the publication of Carle and Rattone's experiments. The bacillus itself, as well as the disease it creates, was extremely difficult to study, and while Brieger made the first important advance in the discovery of tetanin in 1896, it was three years later that Kitasato first obtained the germ in pure cultures and gave to the world the first description of its biologic characters. Since that time scientists in all parts of the world have constantly vied with each other in the attempt to find a remedy that would destroy the germ or its ptomains, and thus afford an efficient means of combating the distressing and fatal disease—tetanus. Naturally they turned to serum therapy for a realization of their hopes, and with what success their efforts have been crowned may be told in a few words. Blood serums are peculiar in their action, and but few of them are perfectly understood. Some of them, as the antidiphtheritic serum, exert their influence solely upon the ptomains, making them true antitoxins, while others, like the antistreptococcic serum, perform their work by destroying the germs themselves and thus putting a stop to the production of toxins. Others again, such as the antitetanic serum, do not seem to have much, if any, effect upon either germ or toxin, and yet from indisputable clinical evidence they possess an immense therapeutic value. Just in what way their good results are brought about has never been determined. Professor Roux of the Institut Pasteur has suggested that their action is of a protective character and is directed upon the tissue cells, fortifying them against tetanin, or the still more deadly toxalbumin described by Brieger and Frankel. This explanation clearly accounts for the wonderful immunizing properties known to exist in the antitetanic serum, and is the strongest possible appeal for the use of this agent as a preventive. Not a single case of tetanus has ever developed after an adequate

ophylactic dose of a reliable antitetanic serum was iven. This fact, demonstrated in hundreds of experiental cases at the Institut Pasteur three years ago, as led to the adoption of a routine practice of immuization by surgeons in places where tetanus is known be endemic. Quite recently a physician told me that e had just used a prophylactic dose of antitetanic erum after a rusty nail puncture, and the results were satisfactory and his patient so free from apprehenion during his illness that he should continue the ractice, even if only for its moral effect.

The curative properties of antitetanic serum are egatively positive, but not positively negative. It ures—or more strictly speaking, it leads to recovery by preventing any further invasion, but it does not ure the tetanus already existing. The only reasonble conclusion, therefore, is that the antitetanic erum should be used frequently at the first suspicion f an attack of tetanus, even before invasion if possile, or at least while the existing poison is not suffient to cause death. While the serum treatment of etanus is not all that could be wished for, nor all that e expect to see it in the future, as men and methods nd means arise for its improvement, yet as we have today it is by far the most successful treatment at ur command. In Scotland, where statistics have been ost carefully kept, the mortality has been reduced rom the former frightful figure to about 35 per cent. n the United States, during the last two years, ccording to Dr. Frederic S. Dennis of New York, ho has carefully investigated the subject, the morality figure is even a shade lower still. Five cases f trismus nascentium were reported last year as successfully treated with the serum—cases which preious to the days of antitoxin were almost uniformly atal.

The experiments of Wasserman and Takaki, based pon Prof. Ehrlich's theory of the formation of antioxins, should be remembered for the sake of future nvestigations in the general system of serum therapy. t present, however, they are interesting only from he laboratory standpoint and are absolutely without ractical therapeutic value. More recently still, conderable local enthusiasm was excited in Rome, here Prof. Bacelli's treatment of tetanus with phenic cid was applied in thirty cases with but one death. his showing certainly entitles the method to further tudy; for while such a result in a single series of ases might be purely coincidental, the truly scienific mind should always stand ready to push investiation to its utmost limits when there appears the emblance of a cue. The very latest, and what appears to be the most reasonable, theory yet advanced oncerning the action of the toxin and antitoxin of etanus, is that of Roux and Borrel, in which they xpress the belief that the toxin attacks the nerve enters with such rapacity that the antitoxin, when dministered hypodermically, does not reach the seat f destruction in time, or in sufficient quantity, to vercome the evil. They reasoned, therefore, that if he antitoxin could be applied directly to the cerebral ubstance, it might reach the vital point by rapid diffusion and be much more effective. In demonstration f this theory they tetanized seventy-nine guinea-pigs or their first experiments. Forty-five of these eceived intracerebral injections of small doses of ntitoxin, and thirty-five of them recovered. Seveneen were treated with much larger doses by the hypodermic method, and of these only two survived. The remaining seventeen were not treated with antitoxin, and they all died. So far this method has only been applied in one case in the human subject. In this case the operation was entirely successful and the patient made a speedy recovery.

Tuberculosis.—Quite a number of toxins, antitoxins and blood serums have been introduced for the treatment of this disease, and with results that should be regarded as most gratifying, inasmuch as they have not all been absolute failures. The original tuberculin of Koch, and the improved product known as "T. R.", are admittedly most dismal failures as far as curative properties are concerned; but in spite of this they have wrought an excellent service in directing and stimulating investigation, as well as being of great value as diagnostic agents. Of the newer remedies of this class, as well as of the antitoxins and blood serums directed against the tubercle bacillus and its ptomains, the members of this Section will be fully informed in specially prepared papers relating to this subject. It remains, therefore, for me to discuss some of the complications of tuberculosis, and leave the consideration of the tubercle bacillus to the distinguished gentlemen who are making a life study of it and its terrible consequences. It has been so often repeated by various competent observers that simple, uncomplicated tuberculosis is easily curable, that it may seem strange to the casual reader that we hear of so few cures being made, The reason is that uncomplicated cases are rarely met with in actual practice, the physician's services as a rule not being demanded until the disease has progressed far beyond the initial stage. Even then it is frequently found that the tubercular infection is the least consequential of the existing lesions. It is a well-known fact that unless tuberculosis is accompanied by some other pathologic condition, it usually remains localized for a long time, and the destruction of tissue from it alone is exceedingly slow. It is when other micro-organisms make their appearance that rapid tissue changes take place and the patient sinks quickly to the point of dissolution. To stop this process of rapid necrosis in the vital organs should be our chief aim, and in order to do so, it were better for us to forget for the time being that the tubercle bacillus has anything to do with the case, and give our entire attention to the organism that is doing the actual damage. In short, rid the case of its complicating influences first; convert it into a condition that is admittedly curable, and then direct our energies to the original disease. Can we always do this? Most assuredly we can not—but we can always try; and inasmuch as it is impossible for us to foretell the result of our efforts, it is clearly our duty to give our patients the benefit of the attempt. We will succeed in a certain number of cases; we will probably fail in many more, at least until effort and experience shall combine to suggest improvements in theory, methods and practice. In the light of past experience and present indications, however, it is reasonable to predict that if tuberculosis in its various forms and complications is ever to be placed in the category of curable maladies by means of medication, it will be accomplished by some method within the realm of serum therapy.

Snake bite.—The antitoxin used for the venom of poisonous reptiles is as surely specific in its action as any remedy known to medical science. The only drawback to its employment is the difficulty of procuring the serum at the required moment. The ab-

sorption and action of the poison are so rapid that death is likely to result before the remedy can be obtained: but where it is possible to apply the serum within eighty or ninety minutes after the reception of the sting, no fears need be had as to the outcome of the case. The limitations of the application of the serum as a curative have led a number of investigators to seek for a reliable prophylactic or immunizing procedure, by means of vaccination or otherwise. Chief among such experimentors are Fraser and Phisalix, who have made exhaustive researches, and claimed decided success with such substances as bile, glycocholate of sodium, cholesterin and the tyrosin of certain vegetables. Calmette, however, whose name will always be associated with the antitoxin of snake venom, has shown conclusively that these substances only furnish a weak and transitory immunity by means of cell stimulation, the same as may be induced by a large number of others, and in no wise act as true antitoxins. So for the present, at least, the only known safeguard for persons living in regions infested by poisonous snakes is to make sure that a supply of the antivenomous serum is kept within easy reach.

Erysipelas.—The writer's experience in the treatment of this disease with blood serum, has been comparatively limited, but it has been so uniformly successful in a number of trying cases that he can not help thinking that if failure should be reported it must be due to the employment of faulty serum or some equally avoidable cause. Marmorek's serum is the one indicated in all stages of the disease, and a number of cases reported by me at the annual meeting of the Illinois State Medical Society on the 17th of last month most conclusively show the immunizing power of the serum, as well as its specific action as a prophylactic and curative agent. The number of cases reported as successfully treated by the serum method already extends into the thousands, as every one interested in the collection of statistics can testify.

Yellow fever.—With the single exception of tuberculosis, there is probably no disease in which the bacteriologists of the Western hemisphere are more intensely interested, at the present time, than yellow fever. We are just at that critical period of anxious expectancy when any moment may witness the end of all dispute as to the question of causation, and the true germ of the disease be established beyond all cavil. And while we are thus waiting for the settlement of this one point, which we confidently hope will enable us to formulate a remedy that will place this dread disease in the column of preventable and curable maladies, it is fitting that we should allow our minds to dwell for a moment upon the names of those most intimately connected with this work. Among those in foreign lands, that of Sanarelli stands out with conspicuous luster, while in our own country we have a full half dozen of equally earnest and equally intelligent workers. Without detracting in the least from the fame of any of these, if asked to mention the man above all others, native or foreign, who is entitled to the palm for pioneer work in this field, for long, untiring and intelligent effort, as well as for modesty in presenting his just claims, we would unhesitatingly breathe the name of the present distinguished president of the AMERICAN MEDICAL ASSOCIATION, George M. Sternberg. Placing the serum treatment of yellow fever upon the same rational and scientific basis as that of diphtheria and other infectious diseases, then, we can not expect the remedy to precede a knowledge of the etiologic germ. Whether this shall eventually prove to be the bacillus icteroides or the bacillus "x" (Sternberg), if these are not identical, or some micro-organism yet to be discovered, remains to be seen. In the meantime the Sanarelli serum should be given a thorough trial, as pronounced success or pronounced failure would materially assist in settling the question of etiology.

Typhoid fever.—So far no serum has been prepared that can be implicitly relied upon as a cure for this disease, although several attempts have been made. The most promising one, at this time, is that of Prof. Chantemesse of the University of Paris, who claims to have had marked success in a number of recent trials—noting rapid defervescene and decided improvement in the general symptoms. He thinks, with a little more time for investigation and opportunity for the improvement in the preparation of the serum, it will take rank with those of well-established therapeutic value. In the matter of diagnosis, however, it is quite different, the Widal test being now regarded as a perfectly reliable and practical method for the busiest practitioner. It is possible to determine by means of this test, not only the very early invasion of typhoid fever, but also whether an individual has had the disease, even after the lapse of many years, in some cases. The test is of especial value on account of its accuracy and the simplicity of its technique.

In the brief space allowed for the discussion of this subject, it would be impossible to give the details of all that has been accomplished in the application of serum therapy to the various diseases and conditions in which it has been tried, however interesting it might be to do so. Up to this time, something more than a score of diseases have been subjected to treatment by this new method, and, as would naturally be expected, with varying success. In addition to those already mentioned, these include among others, pneumonia, influenza, rheumatism, cholera, cancer and sarcoma, pertussus, leprosy, gonorrhea, chancroid and syphilis, bubonic plague, anthrax, chorea and puerperal septicemia. A few of these deserve more than a passing notice, both on account of the prevalence and gravity of the diseases and the promising outlook for the early discovery of efficient remedies. Yersin and Haffkine have already succeeded in greatly mitigating the ravages of the bubonic plague, while numerous investigators have given us encouraging reports in regard to the probable successful management of leprosy in the near future. Sarcoma has undoubtedly yielded in a number of instances to the influence of the Coley mixture, while Asiatic cholera, the depopulating scourge of many nations and of all ages, seems destined to lose its terror through the beneficent agency of serum therapy.

Pneumonia.—Since the discovery of the bacillus of Friedlander in 1883, a host of bacteriologists, including Sternberg, Flügge, Talamon, Fränkel, Netter, Belfanti, Gameléia and many others, have studied this germ and the micrococcus pneumoniæ crouposæ with great diligence, in the hope of arriving at definite conclusions in regard to pneumonia and its proper treatment. It is generally found that mixed infection exists in this disease, and for this reason it will be necessary to pursue investigation and wait with such patience as we can command for the perfect success

that we hope to meet. Serums have already been used, and in some cases with gratifying success. Klemperer reported six cases with excellent results, and his experience has since been duplicated by Mosny, Bonne, Emmerich and Pansini. During an epidemic of pneumonia in the city of Naples, in the month of January of the present year, Pane treated nine cases of a very grave type with antipneumococcic serum. The effect of the remedy is reported as decidedly good in every case, and but one of the patients died.

Puerperal septicemia.—When caused by the streptococcus microbe, as it is in a very large proportion of cases in this disease, is no longer the frightfully fatal affection of bygone years, for it yields in a most gratifying manner to the antistreptococcic serum of Marmorek.

Streptococcal infection.—If this condition meant but a single disease, however severe, instead of a number of distinct maladies and a multiplicity of complications, its presence would not be regarded with more concern than that of tetanus or snake bite. But in all probability a score of such affections as these would fade into insignificance in comparison with streptococcal infection, if the full measure of its destructive virulence were known. We find it in all kinds and conditions of disease, sometimes as the sole pathogenic factor, but more often as an insidious and insinuating "co-respondent" adding dangers to those inherent in the original malady, or even supplying them where none existed before. Already the study of the streptococcus microbe has been productive of much valuable information, and a number of diseases can be traced directly to its presence; but inasmuch as its pathogenetic power is known to vary from absolute innocuousness to the most destructive virulence, there must yet remain much to be determined. The wide variation in its pathogenesis, its unapproachable extent of distribution, and the unusually attractive field it presents to the microscopist, all combine to make its study both fascinating and instructive. Much confusion has been caused by the more or less arbitrary subdivision of the streptococcus into a large number of "kinds" or "species," bestowing such names upon each supposed new discovery as the fancy of the investigator would dictate. Koch, Marmorek, Widal and other high authorities, however, do not recognize any of the classifications thus far made, but regard all the so-called forms of the germ as the offspring of a single parent microbe, and attribute its varying pathogenic effects to such conditions as location, temperature, the kind and health of tissues involved, presence or absence of other micro-organisms, etc. Just why or how the same germ should cause convulsions in one animal and paralysis in another has never been explained, and possibly never will be, but as long as the same remedy, by equally mysterious methods, works a cure in both, we need not trouble ourselves about the pathogeny. Erysipelas, phlegmon and most cases of puerperal septicemia are caused by the streptococcus germ, and their certain and rapid cure by the proper use of Marmorek's serum is a fact so often demonstrated that it seems almost unnecessary to repeat the assertion.

However important it may be to know we have so efficient a remedy for these diseases, it is still of greater interest to know that the same remedy is equally successful in controlling certain complications that are more or less constant in many infectious diseases, including scarlet fever, diphtheria and tuberculosis. Scarlet fever is probably always complicated by streptococcal infection; and in the experience of many close observers in Europe and America, when Marmorek's serum is administered early in the attack the disease is greatly modified, runs a mild course and the patient recovers without any disagreeable sequelæ. Streptococcal invasion is likewise the most constant complication attending cases of diphtheria; and no doubt many of the fatalities reported are due to this cause, and not to the toxemia produced by the Klebs-Loeffler bacillus, which may have been already overcome by the use of diphtheria antitoxin. Mixed infection should be suspected and looked for in every case of diphtheria, and when found a mixed treatment resorted to as early as possible. In this way the present extremely low mortality rate in this disease may be still further reduced, for without doubt nearly all of the fatal cases would show mixed infection if the proper tests were applied, and many more recoveries would occur if the proper (mixed) treatment was used.

It would be gratifying to me to hold a clinic at this time and present a number of tuberculous subjects, which have come under my observation during the last two years. They would all be cases of pulmonary tuberculosis with mixed infection, the predominating complication being of the streptococcal type. In at least two of these cases the complicating factor was so overwhelming in extent and severity that I am tempted to refer to them as cases of *streptococcal infection complicated by tuberculosis*. They had all the classic symptoms of well-advanced pulmonary consumption, and repeated examination of the sputum revealed the presence of the bacillus of tuberculosis, but always in small numbers. They had stubbornly resisted antitubercular treatment for many months; the direction of their progress was continually downward; faith had entirely deserted them, and hope was rapidly going. They were even denied the questionable consolation afforded by the promise of a lingering invalidism, for their physicians had named the limit beyond which they could not survive, and the date was almost reached. Microscopic examination of the sputum had heretofore been directed solely to the tubercular aspect—now it was made with reference to the complications. Streptococci in vast numbers were found. A complete change in the treatment was instituted, which was speedily followed by a most gratifying change in condition. All measures having reference to the tubercular infection were suspended and concentrated effort given to the streptococcal invasion. Marmorek's serum was given in 10 c.c. doses every alternate day until the streptococci all disappeared. By this time there was such an improvement in the general condition that hope was immediately revived and the patients put back upon the former treatment. One of them has remained constantly under my care, while the other, on account of distance from home, was returned to her former physician. In both cases the improvement continued; and now, after a lapse of nearly twenty months since the Marmorek's serum was stopped, my patient reports himself in better health than he has been for many years. Although there still remains a suggestion of tubercular toxemia, it is too slight to cause detention from business, and there has been no return of the streptococcal invasion.

Aside from the many flattering reports that come from all quarters of the globe in regard to the merits of serum therapy as a system, a careful study of its

principles, and personal application of its methods, have convinced me that its vaunted worth has not been overstated. It is based upon reason, common sense, and truly scientific grounds, and its future development can not fail to shed untold blessings upon suffering humanity.

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SOME SOURCES OF FAILURE IN TREATING LACHRYMAL OBSTRUCTIONS.

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Accepted methods of treating lachrymal obstructions succeed in some cases but fail in others, for reasons not always apparent. Bearing on the sources of failure are the following suggestions, grouped under four heads: Constitutional disorder, eye strain, nasal disease and faulty technique.

First. It is evident that if lachrymal obstruction be caused by a chronic constitutional disease, the best planned and most skillfully executed operation will come to naught, for surgery never cured syphilis, gout nor rheumatism, and yet observation shows that this obvious truth is not infrequently overlooked. Spyhilitic infection may diplace the puncta, obstruct the canaliculi, induce a dacryocystitis, locate a mucous patch about the mouth of the duct, cause a periostitis, endostitis or subperiosteal gumma, adjacent to, or necrosis of the bony wall of, the duct; or hyperplastic processes of the bones themselves. These lesions may be found in any stage, from insignificant to gravest, singly or combined; but it is evident that operative treatment of obstruction due to any of them, would be useless unless accompanied by constitutional. More frequent though less amenable to general treatment are lesions of the tear passages, induced by gout or rheumatism or rheumatic gout and involving the mucous, fibrous or bony tissues. Their management by purely operative procedures is quite as futile as surgical operations on deposits of these dyscrasia in other portions of the body, if disassociated from suitable diet, exercise, baths and general medication. Tuberculous and scrofulous diseases do not always spare the lachrymal passages, and one who would do the best for every case of epiphora and record the fewest failures will not overlook the possibility of their presence under the most unexpected conditions. These are the most common chronic constitutional diseases, likely to produce lachrymal obstruction, though others may not safely be neglected. It has occurred to the writer to observe so many failures from exclusive operative measures which subsequently recovered under appropriate general treatment that he is compelled to emphasize the latter.

Second. It is generally accepted that eye strain causes or may cause conjunctivitis and blepharitis; that blepharitis and conjunctivitis may induce inflammation of the lining membrane of the canaliculi and sac and lachrymal obstruction, so the conclusion is inevitable that eye strain may cause lachrymal obstruction. In its earlier stages, epiphora from eye strain is readily cured by the treatment of the diseases of the conjunctive and lids, but like the latter, it returns with subsequent eye strain, while the correction of the eye strain is followed by permanent relief of both disabilities. Less happy is the exclusively operative treatment of lachrymal obstruction from eye strain, as the mutilation of the passages added to the eye strain renders the case even worse.

It is objected that eye strain is not always attended by epiphora. Quite correct; neither do all cases have blepharitis or conjunctivitis; nor would all of a thousand persons have pneumonia if suddenly plunged into an ice-cold stream, but some would. Unquestionably, there are conditions in certain individuals which direct the disturbance of eye strain to the lachrymal passages, that are absent in others. Among these may be noted anatomic deformities of the bony walls of the duct. It is a clinical fact that lachrymal obstructions are more frequent in persons with a very broad or a very narrow-based nose. It is an anatomic fact that such faces have the bony wall of the duct flattened either anteriorly or laterally, so that the actual caliber of the passages is diminished and the more readily obstructed by morbid agents acting upon their lining membrane. It is not improbable that other congenital abnormalities determine the eye strain toward the lachrymal passages and cause obstruction. Further, it is not impossible that such deformities in some cases render failure inevitable from any or all treatment. We can lengthen a shortened leg by a mechanical contrivance, correct ocular defects in the shape of the eyeball, by lenses; but we may not hope to make round a bony lachrymal duct greatly flattened in any direction.

Is it inquired how eye strain causes epiphora? Answer may be made:

1. By direct extension of disease from the conjunctiva and edges of the lids, to the canaliculi and duct and sac. Retention of microbes in the lachrymal lake enables them to manufacture a larger volume of debris, as well as augment their own armies, conditions favorable for causing disease of the tear passages. 2. By disturbing the position of the puncta, through muscular action of the lids in efforts to overcome the refractive defect. 3. By interfering with the natural action of the lid muscles in propelling the tears through the canaliculi and sac to the duct. The clinical proof, that eye strain causes epiphora, and its relief stops it in certain cases, is abundant, but the scope of this paper does not permit of its presentation. If seen early in their course no other treatment than the relief of eye strain is needed; but later, when strictures have formed, or dacryocystitis, or other serious complications, surgical interference must be added to the removal of the eye strain. The practical point is, correction of eye strain will remove lachrymal obstruction in some cases and benefit all.

Third. Some failures to relieve epiphora are due to the overlooking of a morbid condition of the nares adjacent to and involving the opening of the duct into the nose. Clearly it is quite as essential to examine the terminal as the beginning of a continuous tube if we would remove all obstructions. The variety, frequency and gravity of nasal disease render it surprising that the duct is not occluded with greater frequency than is shown by clinical observation. We can not discuss the nature of the morbid condition of the nares or the means for their removal, but their importance is unlikely to be overestimated. Ophthalmic surgeons who do not treat nasal diseases need to be constantly on their guard to detect their presence, and refer the cases to one able to intelli-

ently care for them, lest they unduly increase their failures in treating lachrymal obstructions. The clinical evidence is abundant, showing that failures to relieve epiphora by lachrymal operations have been made successes by rational treatment of nasal diseases.

Fourth. Some failures in treating lachrymal obstruction are due to faulty technique. While there are some points of this technique on which ophthalmologists differ, its general principles and most details are universally accepted. Time admits only a note respecting a few points of faulty technique.

1. If a canaliculus be so divided that the gap in its walls opens to the air, instead of pressing against the eyeball within the lachrymal lake, it is quite clear that epiphora will remain unchecked, and further, the chances are that it will always continue thus. All operations upon canaliculi, puncta or sac should be such as to leave the opening of the upper end of the lachrymal tube within the lachrymal lake. A syphon will not work unless its upper end lies beneath the surface of the fluid it is expected to drain. The violation of this mechanical law renders a lachrymal operation nugatory.

2. Another fault in the technique is the extensive division of the lachrymal passages, when a slight one would have accomplished the desired end. Thus if the puncta be slightly everted, and so remains after removal of all disease of the conjunctiva and lids, it is quite unnecessary to slit the canaliculus extensively. Long since, Dr. Prout showed us that in such cases the epiphora could be effectually stopped by operating upon the vertical portion of the canaliculus alone. Sometimes a simple division of the inner wall sufficed; at other times a V-shaped piece was removed from the inner wall, the top of the V being at the puncta; at other times at the base of the vertical incision, a horizontal bit of conjunctiva was removed, the contraction of the scar on healing of the wound pulling inward the open mouth of the canaliculus, so as to place it in contact with the eyeball and within the lachrymal lake. If the horizontal portion of the canaliculus calls for division, operation should be limited to the least that will accomplish the end sought, otherwise failure will be courted when success was in sight.

3. Another fault is the election of the lower canaliculus so frequently. Unquestionably, there are cases in which choice of the lower canaliculus is imperative as when stricture lies in its course, or at its junction with the common canal, but otherwise division of the upper canaliculus affords better chances for relieving an epiphora. As the lower canaliculus is larger and better located for drainage, its being left intact is important. Operations upon the upper canaliculus render it easier to enter the duct by either probe or knife, because the angle to which these instruments must be elevated is smaller; hence the sac is less injured by the knife; the lining membrane less twisted or torn by probes; the points of syringe or canula more readily brought in line with the direction of the duct, and so its surfaces more easily cleansed and treated.

4. Undue violence is responsible for some failures in treating lachrymal, as in urethral obstruction. Too great or misdirected force in using probes complicates subsequent treatment, if it does not defeat its object by tearing the lining membrane, injuring the periosteum or making false passages. While these accidents may not always be avoided by the most tactful operator, because of the nature of the obstruction and fragility of adjacent tissues, they will be reduced to a minimum by exact diagnosis, and a self-control that bides its time to most safely attain its object.

5. Timidity in using force adequate to dilate strictures is a source of not a few failures. This may spring from uncertainty as to the size or direction of the passage or the resisting power of the stricture. If it be definitely settled that the point of the probe be in the axis of the passage, and that there be an opening in the stricture, very considerable force may safely be employed. Aside from the purely personal equation of the operator, failure is avoided by accurate diagnosis and by the use of such force as is needed for each special case.

6. Rigid ideas respecting the shapes and sizes of probes diminish the chances of success in overcoming lachrymal obstructions. Clearly, one who sees no advantage under any circumstance, in the use of probes larger than Bowman No. 6, will not relieve a case that calls for Theobald No. 16; or he who thinks that only the largest probes will avail aught will fail in the best results in a case which needed Williams No. 5; or he will err who uses any probe, when the local application of hot water and the pumping through the lachrymal canals by Gould's method, of aseptic or antiseptic fluids, suffice to remove the obstruction.

Doubtless cases have best been treated by each different kind of probe and each size, so that he is wisest who selects his probe because of its fitness for a particular lachrymal canal, rather than attempts to make the canal adapt itself to his probe: the shoe ought to be made for the foot, rather than the foot made to adapt itself to the shoe.

Necessarily, small probes only are admissible through the undivided canaliculus; larger ones when the sac must be opened, and it be desired to make the duct large enough for the flow of tears by simple gravity from lachrymal lake to nose; for this latter purpose Theobald's probes have served my needs admirably. Williams' probes with olive-shaped points and small flexible shanks have an especial value in cases of moderate strictures, calling for little pressure to induce absorption, and for locating and defining the same.

They have an admirable facility in gliding about obstructions with the least injury to adjacent structures. Bowman's probes occupy an intermediate position, and are especially useful in promoting absorption in moderate-sized ducts. Failures will be less frequent, as each operator uses common sense in the adaptation of his probes to the especial features and different stages of each case.

SUMMARY.

It is urged that fewer failures will attend the treatment of lachrymal obstructions, if the operator in each case:

1. Recognizes and treats the chronic constitutional disorder which caused the obstruction.
2. Removes all eye strain.
3. Makes sure that the nares adjacent to the opening of the lachrymal duct are rendered healthy.
4. Perfects himself in a faultless technique.

103 Cass Street.

THE yellow fever ravages in the South this week once more emphasizes the demand, Let us have a Department of Public Health!

TREATMENT OF CHRONIC SUPPURATIVE DACRYOCYSTITIS.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY A. E. PRINCE, M.D.

SPRINGFIELD, ILL.

In response to an invitation from the Secretary of the Ophthalmologic Section of the AMERICAN MEDICAL ASSOCIATION, I send the following brief paper, the purpose of which is to present the method I employ for obliterating the lachrymal sac.

During the earlier years of my practice I tried medication, irrigation and large probes, but the percentage of relapses was so great that I finally discontinued endeavoring to preserve the patency and restore drainage in all cases of chronic suppurative dacryocystitis. For the benefit of those who conclude, in any given case, to obliterate the lachrymal sac, rather than to attempt any of the various plans offered for the preservation of drainage, I here offer a very simple, and at the same time a very satisfactory method of dealing with this question, which has not disappointed me in its results for several years. My procedure is as follows: Introduce a probe through the canaliculi into the lachrymal sac. Direct the point toward the skin so that the point of pressure may be discovered at the surface (Stevens' tenotomy hook serves well for this purpose). Incise the skin over the probe, and enlarge the opening upward and downward the entire length of the sac. Lay open any sinuses which may exist. Apply a saturated solution of monochloracetic acid by means of a cotton applicator over the exposed surface of the sac and sinuses. Pack the wound with iodoform, and keep it packed until healing is complete. The iodoform remains in situ, and prevents the cutaneous wound from healing before the bottom is closed.

I have tried excision of the lachrymal sac and application of other forms of caustics, and the results in comparison have led me to prefer the monochloracetic acid to any other agent. I have packed with gauze, and the result has not been so satisfactory.

For years I have used pulverized iodoform to pack the cavity of the globe after evisceration, and the behavior of pulverized iodoform in this cavity led me to believe that it would serve an equally good purpose in packing the lachrymal sac.

THE USE OF LARGE PROBES IN STENOSIS OF THE LACHRYMAL DUCT.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY MELVILLE BLACK, M.D.

PROFESSOR OF OPHTHALMOLOGY AND OTOLOGY, GROSS MEDICAL COLLEGE, DENVER COL.

In the presentation of this subject no reference is made to such mild cases of lachrymal stenosis as can be relieved by probing the canaliculi with small probes, followed by syringing, nor to cases dependent upon closure of the lower opening of the duct by pressure from the inferior turbinated body. The class to which I desire to call attention is that of true stenosis of the lachrymal duct, in which mild measures and nasal treatment are of no avail.

In order to pass a large probe down the lachrymal duct it is first necessary to slit a canaliculus. It is very important that the canaliculus of lesser function should be selected. The punctum and canaliculus of the lower lid unquestionably have greater function in draining the palpebral aperture of fluid than have the corresponding parts in the upper lid. Once the canaliculus is slit and its punctum destroyed, its suction power is lost, and it ever after acts in an indifferent manner. If the lower canaliculus is slit, probes passed and the duct otherwise treated until it is thoroughly patent, this eye will never again be free from epiphora when exposed to inclement weather. On the other hand, if the upper canaliculus is chosen as the means of gaining access to the lachrymal duct, it will be found that after the passage is rendered patent the lower canaliculus will be able to keep the eye free from tears. I deem this point of great importance, and believe that the many failures in the cure of lachrymal duct stenosis are due to the destruction of the suction power of the lower canaliculus.

If probing the lachrymal duct for the relief of stenosis is to be of any advantage we must observe the same rules as in treating stricture of the urethra. The duct must be dilated *ad maximum*. It is my custom to pass, at the first sitting, the largest probe that can be introduced. The canaliculus in the upper lid is slit with a Graefe cataract knife, with the aid of a Bowman's grooved director. The director is passed through the canaliculus, then turned to the vertical and passed to the bottom of the lachrymal sac. The Graefe knife is used with the director in the vertical position. The director is now removed and a graduated probe introduced, to determine the size of the duct. If a marked stricture is encountered, an Agnew's knife is passed down the duct and the stricture cut. If no stricture is found, the Agnew knife is not used. The size of probe that the canal will admit can be fairly well judged by the passage of the graduated probe. I find that it is rarely that a No. 10 Theobald probe can not be passed. If the probe first passed is loose in the canal one after another of larger size should be tried until one is found that is passed with difficulty and completely fills the canal. Strong pressure should be exerted on the mucous membrane throughout the entire length of the canal. It is my custom to examine the nose to see that the probe is well down in the inferior meatus. If it is not, this or a smaller probe is forced down until it can be seen or felt beneath the inferior turbinated body. The probe is allowed to remain *in situ* about ten minutes. It is then withdrawn and the lachrymal passage syringed with a saturated solution of boric acid until bleeding ceases. The patient is then sent home and instructed to apply lead and opium wash on pledgets of lint which have been cooled on a block of ice. This should be done almost continuously for 24 hours. At the expiration of this time I inject, with a lachrymal syringe, into the duct a few drops of 10 per cent. solution cocain. A probe a size smaller than the largest one passed the day before is then passed. The negative pole of a galvanic battery is then connected with the probe, the positive pole being placed in the patient's hand. Then from two to three milliampéres of current is turned on for ten minutes. When the probe is removed it will be found to be very loose, owing to the electrolytic action of the cathodal current. The lachrymal passage is syringed free of blood as on the day previous. There is usually a little bleeding after the removal of the probe, for the first four or five days. The patient

is instructed to use the lead and opium wash for four hours in the same manner as on the day previous. On the third day the same probe is passed, unless it is found to be loose; in which event a size larger should be used. The 10 per cent. cocain solution should have been previously used to relieve the pain. The probe is allowed to remain in the passage ten minutes. After its removal the syringing is practiced as before. A few drops of 25 per cent. solution ichthyol in water are now syringed into the passage. The probe is passed daily for about ten days, accompanied by the syringing of saturate solution of boric acid, and ichthyol solution. The largest probe that the duct will take should be used. At the end of the first week the battery should be again used in the manner described. After the first ten days the above procedures should be carried out three times a week for two weeks, then twice a week for two weeks. After this it should be done according to indications until all epiphora ceases. The use of electricty should be practiced every week or ten days for the first six weeks, and after that according to indications. It is impossible to lay down hard and fast rules in these cases. I generally say to my patients that a cure may be expected in two months. I am frequently able to dismiss them sooner. My experience has been that a No. 10 probe can be passed at the first sitting, and that in a few days a No. 13 or 14 can be passed. I have passed the No. 16 probe in a few cases.

When blenorrhea or phlegmon is present I expect complete disappearance of these symptoms during the first week. When superficial necrosis of the lachrymal bones exists, treatment is sometimes more protracted, and has to be persisted in until the necrosed bone is absorbed. In cases of fistula with sequestrum of bone it is necessary to cut down and remove the sequestrum.

The three points that I desire especially to emphasize are; the opening of the upper canaliculus, the use of the largest probes possible of passage, and the electrolytic action of the negative pole of the battery.

THE VALUE OF LARGE PROBES IN THE TREATMENT OF LACHRYMAL STRICTURE.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY H. O. REIK, M.D.

Instructor in Ophthalmology and Otology, Johns Hopkins University, and Assistant Ophthalmic and Aural Surgeon, Baltimore Eye, Ear and Throat Charity Hospital.

BALTIMORE, MD.

Knowing that the treatment of lachrymal stricture would be one of the subjects of discussion at this meeting, and knowing also that there exists among ophthalmic surgeons a very wide difference of opinion concerning the use of large probes for this condition, I thought it might be of interest to review and report upon the cases treated under the observation of Dr. Samuel Theobald, whom all of you know as the author and chief exponent of the really large probes. At the outset it would seem advisable to consider what is meant by "large probes," for notwithstanding the fact that Dr. Theobald has so frequently explained this point, and insisted on the difference between his probes and those of Bowman, we still see in literature frequent references to Bowman's No. 6 as a large probe. Then again, the probes obtained from the instrument-maker under the name of Theobald are not always copies of the original model. I have seen surgeons using what they supposed was a Theobald probe, but which in reality bore but slight resemblance to the proper thing. Some of them, perhaps all of them, are of proper size, but frequently they are improperly curved, or present extremities that are either very blunt or very sharp, and thus the possibility of delicate manipulation is precluded.

When properly constructed, the probes should have a conical-shaped point; the smallest should have a diameter of .25 mm., the largest, No. 16, a diameter of 4 mm., and the difference in diameter between successive numbers should be .25 mm. The smaller sizes —Nos. 1 to 8—should be made of coin silver, while the larger ones—9 to 16—may be made of pure silver, or preferably, aluminium. I will pass around for inspection a set made according to the above directions, which were published by Dr. Theobald.

The cases which, through the kindness of Dr. Theobald, I have had the privilege of studying, comprise in all 130—63 of which were seen in Dr. Theobald's private practice and 67 in his service at the Johns Hopkins Hospital and at the Baltimore Eye, Ear and Throat Charity Hospital, in each of which last-named places some were treated directly by him and others by his assistants. The 130 cases are not selected ones beyond the point that they all received treatment with probes ranging between Nos. 12 and 16. Of course a great many more than 130 patients appeared in whom the diagnosis of lachrymal stricture was made, but as they refused treatment or did not continue beyond the smaller-sized probes, they were not considered to be of much importance in this paper. In the cases here included the condition of affairs at the beginning of treatment consisted of persistent epiphora in all; blenorrhea of the sac in all but a few; lachrymal fistula in some, and chronic blepharitis or conjunctivitis in many. The pathologic lesion in probably all of the cases was one or more strictures in the nasal duct.

We find that of all of the patients seen in whom the diagnosis of stricture of the nasal duct is made, about 50 per cent. either decline operative treatment or fail to return after the first probing. These patients consist largely of nervous men, who, after hearing the statement we usually make before instituting treatment, decide that they will not undertake it. It is our custom to explain to all these patients that the treatment, despite the use of local anesthetics, will be more or less painful and necessarily protracted. This probably has the effect of scaring off some of them. About 15 per cent. of all who undertake the treatment fail to carry it on to the end. They will receive the probes up to perhaps Nos. 10 or 12 and then, as the epiphora has ceased, they are disposed to stop treatment before we are willing to pronounce them cured. Of the cases reported here, which include a number of children, 75 per cent. received probing up to and including No. 16. About 50 per cent. of all the children under 12 years of age received No. 16, and 50 per cent. of the remainder received No. 15, leaving only 25 per cent. of the children under 12 who were allowed to stop short of that point.

What have been the results in these 130 cases in which the large probe treatment was thoroughly carried out? All but 3 were regarded as cured when treatment was stopped. I may say here that the length of time under treatment varied considerably,

some patients being discharged at the end of a month or six weeks, while others were kept under observation more than a year. Of the 3 referred to above, one was a particularly obstinate case in which several distinct strictures could be felt in the duct; another was much improved, though not cured, the stillicidium being only slight and occasional, and the third was a case in which the stricture resulted from traumatism. In this last case the treatment was very painful, the scar tissue being difficult to overcome, and the patient did not continue his attendance as long as we desired. He was vastly improved, a fistula which was present having healed and the blenorrhea of the sac which accompanied it being decidedly lessened.

It is practically impossible to learn the whereabouts of all these patients today, as most of them were dispensary cases and have moved one or more times. An effort was made to communicate with them in order to learn their present condition, and we succeeded in quite a fair degree. Perhaps a dozen cases were heard from and their condition noted within six months from the cessation of treatment, but we will only consider the 39 cases which have been seen, or from whom reports have been received, at periods varying from one to eight years after the cessation of all treatment. Thirty-seven of them remained cured when last heard of, as follows: Ten last heard from after the lapse of one year; 11 after two years; 2 after three years; 6 after four years; 1 after five years; 2 after six years; 4 after seven years; and 1 after eight years. If the two which have relapsed be added to the three in which a cure was not at any time claimed, we have five out of a total of 130 in which the treatment may be said to have failed, although this would be an extreme statement, for in both of the relapsed cases the patients enjoyed a period of comfort, with absence of epiphora, of more than two years. It would seem, then, that if the treatment is thoroughly carried out, we may expect to effect a cure in about 95 per cent. of the cases, and a relapse may occur in about 5 per cent. of these.

I desire to express my thanks to Drs. Hunter McGuire, Jr., and James Bordley, for much valuable assistance in following up these cases and preparing the statistics.

DISCUSSION ON PAPERS OF DRS. CONNOR, PRINCE, BLACK AND REIK.

Dr. D. S. REYNOLDS—No more interesting subject could be found, for the reason that we know so little about it. I listened with attention to Dr. Connor's paper because it seemed to me to be very timely. I have never seen lachrymal disease in the perfectly sound and healthy individual. I have serious objections to entering inflamed mucous-lined channels with probes and I utterly abhor the idea of the Theobald probe, 4 mm. in diameter. I submit it to any gentleman who has ever examined the bony passages of the lachrymal apparatus, that a probe of that diameter can scarcely be passed in the Caucasian subject. I am aware that many negroes have lachrymal passages of large diameter, but I am sure that a probe of more than 2 or 3 mm. in diameter can not pass without doing damage to the passages of a white man. There is no cause of epiphora that can not be discovered by careful examination. If it be due to some destruction of infiltrated tissue arising probably from come trouble in the nose, as most of these cases do, it can be easily found if sought for. I have heard a great deal about the innumerable cures of systematic probing, but I have never seen any of them that will wear well. I have seen many cases of epiphora that by carefully advised constitutional agents and the confining of local treatment to the diseased membrane of the nasal cavity result well. I take the Anel's syringe and a 2 per cent. solution of sodium chloride and try to pass that through the canal instead of the probe, and if the fluid can be passed through the canal where no suppurative changes are present I hold that to be a contra-indication for any other surgical measures.

These cases of Professor Holmes belong to a special class. They are not only chronic cases, but people with constitutional taints or who have been treated by harsh means that destroyed the duct and canal. Primarily epiphora calls for no probing, and the presence of the condition merely suggests abnormal conditions that exist in the nasal apparatus.

Dr. CASEY A. WOOD, Chicago—I would like to point out to you that even where it is proper to use probes, and even where a cure may be looked for after a considerable time, failure is exceedingly common. It is not always possible to discover whether probing has succeeded in many cases because these patients become tired after a while of having their ducts probed and cease to appear at the office of the surgeon. It interested me some time ago to discover the reason for the non-appearance of these patients. The excuses were found to be trivial, the patient is obliged to leave town or disease has occurred at home, and there are many additional reasons that are given for discontinuing the treatment. That this form of it may be successful, one must, as Dr. Reik has pointed out, often continue it for months or in some cases even for years. One of the principal reasons for their deserting the oculist's office is the relief the patient gets at the outset. The epiphora disappears, the symptoms improve and the patient feels that he is cured and does not think it necessary to come back. In the city of Chicago men and women seem to have very little time on their hands and can not continue to visit the office for weeks to undergo a painful treatment, even though it may be good. Now I want to point out a way in which, in the majority of instances, these results can be improved. It is my practice not to treat these cases in my office for more than two or three weeks, and one can usually induce them to come that often, but during those two weeks I do all the accessory work that I consider necessary, treatment of the nose, etc., with the introduction of as large probes as possible, and I then teach the patient to use the probes himself and allow him to continue the treatment indefinitely at home. Such a plan will be found to succeed in the majority of cases.

Dr. FRANK ALLPORT, Chicago—This is a broad subject and one that can hardly be fully discussed in the length of time we have to talk. I am sorry we did not have an opportunity to hear more of Dr. Holmes' paper, because we only got a glimpse of its value. As Dr. Reynolds said, I presume he only operates in this radical manner in those cases in which all other means have first been tried. I think there can be no question that we all feel alike on this subject, that we all have cases that do not get well and we can only wonder why. Some use small and some large probes. I think one reason why we do not get better results in these cases is because a great many of them are treated along stereotyped lines. We think the first thing to do is to rip up the apparatus without any regard to its normal physiologic condition and pass probes that are as large as can possibly be put in. My practice formerly was to limit the probes only to the capacity of the duct, but a long line of failures led me to change.

I believe that 80 or 90 per cent. of the cases of epiphora originate in the nose and should be treated primarily from that standpoint. Most surgeons practically ignore this point. I also feel as Dr. Reynolds does, that I have simply learned to abhor and detest the large probes. I no longer use as large a probe as I can, but as small a one as is adequate, and since I commenced that practice I have had better results. Some surgeons seem to think all that is necessary is to have a large

e down which tears may flow, but you may have a canal ge enough to pass a No. 16, and if the physiologic suction paratus is destroyed the tears will stand in the sac and not down. You must have the physiologic condition of that paratus retained. I never cut the duct if I can possibly get ng without it. I try to preserve the physiologic function m the punctum to the termination of the nasal duct and a ge probe, 5, 6 or possibly an 8, can be introduced after tching without increasing the punctum. I have here a le instrument like a hollow probe and containing a con-aled knife, which can be passed through the stretched nctum and then made to expose the knife and cut the stric-re in the duct. (Exhibiting the instrument.)

Dr. J. E. MINNEY, Topeka—I have no doubt as to the suc-s of Dr. Reik's work nor of these gentlemen here advocat-g the Theobald probes and those of you who remember Dr. erby's work will remember what sized probes he used, the gest as big as my little finger. These men succeed and it is tonishing that in my practice I have failed to use anything ger than a Bowman No. 8 and I find I have treated 250 cases. hat may seem large but it is a fact. A point that impresses e is this, that every oculist must be more or less of a rhinolo-st unless he wishes to divide his fees with some one else. He ust know something of everything and everything of some e thing.

I have no use for the lotion of opium and lead. I use hot ater and boracic acid. A 5 per cent. solution of cocain I have und sufficient. Electricity I have not used. Is it not possi-le that we create a great many infidels by our use of so many hings when a much simpler practice would be as good?

Dr. GEORGE M. GOULD, Philadelphia—In reference to these roubles I simply wish to emphsize one or two points which I verlooked in my early practice and which some of you may ave neglected. I have no hospital or dispensary practice, ence do not see so many of these cases. In the last two years believe I have had occasion to use probes only once. I have ound that there are a large number of cases in which epiphora simply due to an excess of tears and not because the duct ould not carry off the normal secretion. I think eye-strain the primary cause of these. As the result of long-contin-ed eye strain you have chronic conjunctival trouble with an xcess of tears and if you cure the cause the epiphora will disappear. Several years ago I published a little article, and have used the method there suggested probably a hundred r more times, and have never failed in any case in which here was not an organic stricture. The method consists in ubmerging the eye in an astringent medium, the contents of he duct being first forced into the sac by pressure and then by filling the sac with the lotion and pressing downward it escapes into the duct. You can teach patients to do this at home and et them report to you once a week.

Dr. J. L. THOMPSON, Indianapolis—There have been some very excellent papers presented to us and we have not time to consider them all. Dr. Connor's paper was very excellent and Dr. Gould has in his remarks led me to think of the condition we so often find from excessive smoking, etc. In that class of men who are given to smoking, drinking, gambling and other things that we do not think right, there are many cases of epiphora that are cured by relief of the strain.

I have been trying to learn something about lachrymal troubles for 26 years and I notice the gentlemen who introduce new methods have excellent results, while I do not have one-fiftieth part of the success they report with the same methods. I do not know why, for I do not think I am so awfully stupid.

At the last international Ophthalmologic meeting at Edinburg Argyll Robertson said that Dr. Cooper and not Dr. Theobald was the originator of the large probes. I would like to ask Dr. Reik if he can tell us anything about that point.

I have used large probes, some large enough for a rhinoceros and have thought my cases cured, but in a year or so some of them write "I believe you promised me a cure." I know how to answer that letter, because I never promised anybody a cure in my life. I believe the majority of these cases will come back in a few years just as bad as ever. Sometimes I use the style, allowing the patient to put it in at night and take it out in the morning. Mine has been a private practice entirely. I asked one of the gentlemen at Moorefield's "do you cure these cases?" and he said that many of them go to other hospitals after a time. I usually tell my patients now that I am not going to perfectly cure them.

Dr. T. A. GRIGG, Butte—We could not have a more timely series of papers, though we have all had much trouble over the treatment of lachrymal diseases. Laying aside those cases due to eye-strain, slight catarrhal troubles and the like, and taking up these cases of pure organic obstruction, the first thing I do is to dilate the punctum and try to pass the boracic acid solution through the duct by means of an Anel's syringe. I examine the nose thoroughly and sometimes divide the strictures and pass as large a probe as convenient, from 6 to 8 Bowman. Usually in these cases that can not stay I use a canula about as large as 6 or 8 Bowman probe and leave it in place from three to nine months, with very satisfactory results. There is a pathologic law that an intermittent pressure will produce hypertrophy and that continued pressure will produce atrophy, and my theory is that if you can use a lachrymal canula you get a pressure on all sides and cause an atrophic condition that will relieve the obstruction. With this method of treatment I have had very satisfactory results. Where there is a purulent condition I often omit the canula for a few days and syringe the duct with a weak solution of nitrate of silver. I have some cases treated five years ago which are all right at the present time.

Dr. J. O. MCREYNOLDS, Dallas, Texas—I should like to express my gratitude to the gentlemen who have contributed papers or discussion on this subject, for no cases have given me more trouble than these. The ultimate object to be accomplished is by no means to secure a sufficiently large nasal duct, as Dr. Allport has said, and that point ought to be published further than it has been. In harmony with what Dr. Gould has said, I would say that I have been able to cure some of these cases by diligent attention to the condition of the conjunctiva and by giving the correct glasses. I have not simply given an antiseptic solution to be used occasionally, but very frequently during the day. This keeps the duct cleansed out, and we have then the best condition possible for relieving the pathologic state. I have even sometimes given patients a syringe which they could use themselves.

Dr. R. F. LE MOND, Denver—This is a subject we need to have discussed and experimented on very much, because when we get hold of these bad lachrymal cases we are like the man who got his hands full of a wildcat; he wanted somebody to loose his hands. I think I have gained several good points by hearing this discussion today. I want to say that a method which I have been using for the last eighteen months, and which has acted very well in many cases, though not so well in others, is the use of a hollow probe of pure lead, which I introduce into the duct curved so as to fit the canal, and let the patient wear it for a month, washing it out two or three times a week.

Dr. E. C. ELLETT, Memphis—I did not hear the papers, and do not know how much was said about the advantages that lead styles possess over any perforated canulæ. I have never yet seen a canula that would drain a lachrymal passage. Lead styles are so convenient, so easily fitted to the case, and secure much better drainage than you can get through the lumen of a canula.

Dr. L. W. FOX, Philadelphia—I wish to add my experience in the treatment of lachrymal obstruction, which every one has

found the bane of ophthalmic surgery. I belong to the school that uses the large probes and believes in them. I just heard the remarks about drainage with the canula. After many years of experience I have partially evolved a canula which I wish to present. It is a silver tube, modeled on those that have preceded us, and I have found it as satisfactory as anything I use. For many years I have used the large Theobald probes. The lead style has always been a favorite of mine immediately after operation, using that for three or four days and then following it up with these silver canulæ. In the large manufacturing districts about Philadelphia we see many of these cases, sometimes having ten or twelve a week at our clinic, which consists of 4000 general cases a year. Where there is ordinary epiphora and the mouth of the canal is closed, I use the probe to dilate to the fullest extent possible, and in those cases I have success, whereas if the stricture is farther down, or there is a latent abscess, the operation of passing the Weber or Stilling knife and dilating to the fullest extent, is followed with the lead style and then with these canulæ. While I was house surgeon at Moorefield's we had an enormous number of cases, and the Cooper method was followed exclusively. In Paris they used the narrow probes.

Dr. WOOD—How long do you leave the canula in?

Dr. FOX—For six months. I take them out occasionally and wash the duct with a solution of boracic acid. I find I am often obliged to keep in these canulæ and to probe from year to year.

Dr. W. H. WILDER, Chicago—I think it is an encouraging sign of the times when we hear so many men advocating the conservative treatment of these cases, and I dare say many of us would be willing to predict that the time will come in a few years when the indiscriminate probing of lachrymal cases will be relegated to the past. I dislike to see a surgeon reach for the Bowman knife as soon as an epiphora case comes in. We should endeavor to preserve the integrity of the canaliculus; once it is slit up we can never replace the delicate mechanism.

I believe most certainly that many of these cases could be relieved completely if the conservative treatment were adopted from the beginning. At first there is no organic stricture whatever. It is merely a catarrhal condition and the duct is obliterated by reason of the swelling of the mucous membrane, and temporizing measures for a short time even, without the slitting of the punctum, will in very many cases suffice.

I think Dr. Holmes' specimens will illustrate very well that in some of them you could introduce the Theobald probe, but in many lachrymal ducts such probes would do great damage.

Dr. KEGLEY—In regard to teaching the patients to pass probes themselves, it seems to me the difficulty with all of us has been that we do not know when to discharge our patients. About the first thing I do is to teach the patient to pass the probe himself, and as soon as I do that I discharge the patient and the rest is with him. I have perhaps fifty cases now that I have been watching for eight years and every one of those patients is satisfied. I never go above a No. 8 probe, for I think that is large enough to drain off the secretions.

Dr. LEMOND—I want to ask if any of the gentlemen present have tried the obliteration of the sac by means of the galvanic cautery?

Dr. CONNOR—I have been extremely interested and instructed by these papers and the discussion that has been presented upon them. In the whole range of ophthalmology I know of no class of diseases that have given me so much trouble. At the same time I think the way to get out of the trouble is to study its source, and I am convinced that if the members of this Section look at the question from that standpoint they will find their results increasingly better. If they apply the same common sense to this class of troubles they do to the extraction of cataracts, their results will become as good as in that case. The earlier the cases are seen the better the results, and by inducing the patient, through the general practitioner, to undergo treatment before organic changes have occurred, we shall diminish our sources of failure. As I remarked respecting probes, I think they should be used on the same general law that we use instruments anywhere. I have once in a while found a case where everything else failed me and the Theobald probe has brought success. My conviction is that one of the forces by which the tears are discharged through the canal is the air going in and out over the end of the tube. That is according to the idea of mechanics; consequently I never use a large probe if I can help it, and only when I am compelled to make a large opening in the sac. I think the use of hot water is helpful in some cases. I think, as Dr. Thompson stated, it is well to have the patient understand at first that one passing of the probe will not cure them. They must not expect to get well in one or two weeks, and if they are not willing to undertake what is necessary for a cure it is better not to have anything to do with them.

Dr. BLACK—It seems to me that the conservatives have it, and I want to align myself with them. While my paper may seem to have placed me among the radicals, at the same time you must remember that I made the statement that it was not the cases capable of being treated by mild methods that I was dealing with. My paper had to deal with difficult cases, and in my experience these have been the cases where there was purulency of the sac. Where there is simple stenosis, especially at the upper end of the lachrymal apparatus, I believe that mild methods will accomplish a cure in a large percentage of cases, and that we should discourage the consideration in all cases of the general physical conditions I would not for a moment advocate. It goes without saying that any man doing special work should not fail to recognize that he is still a practitioner of medicine. It does seem to me, however, that it is within reason that if it is necessary to pass a probe we must take into consideration the capacity of the passage. To dilly dally around in the duct with a little bit of a lachrymal probe serves to tickle it and accomplishes nothing. We must put a probe down for the purpose of producing pressure: I can conceive of no other reason for introducing, and if we want pressure let us use a probe large enough to fill the passage. In my experience during a service in the Manhattan Eye and Ear Hospital in New York, where I had the opportunity of observing other men using different methods, I was strongly impressed with the fact that the men who never used probes larger than No. 8 were the men who had these cases continually on their hands. The men who were inclined to use rather energetic means in these severe cases accomplished something and their cases showed marked improvement and were soon discharged. My experience has been that when I have one of these marked cases of obstruction mild measures accomplish very little.

Dr. REIK—I did not attempt in my paper to consider the value of large probes in the treatment of lachrymal stricture, further than a brief statement of our results in those cases where the large probe treatment had been thoroughly carried out. The 130 cases there considered contained none of those mild cases of epiphora due to obstruction of the puncta, reflex irritation or slight catarrhal troubles, but all belonged to that class in which there is an organic obstruction in the duct and, as I stated, in most of the cases we were able to locate by the sense of touch one or more distant contractions. Our cases were followed up for periods varying from one to eight years, and I know of no other method of treatment for this class of cases which will show 95 per cent. of cures. Dr. Reynolds attacked the large probes in his characteristically forcible style, but I think it would not be difficult to demonstrate to him the ease with which a 4 mm. probe can be introduced into the duct of the Caucasian subject, and I think, furthermore, if he will measure the lachrymal ducts of any large number of subjects he will find the average diameter considerably larger than he

at present inclined to believe. Dr. Wood's plan of teaching e patient to use the probe himself is a good one, and we have de use of it in many cases, especially where the patient lives a distance and can not make frequent visits to us. Dr. All-rt's experience is entirely at variance with ours. It is true at after the use of probes to Nos. 8 or 10 epiphora ceases in any of these cases and the patient is inclined to call it a cure, t a study of our records shows that if these cases be followed, t simply for a few of the summer months, but for a year, so to include the winter months, numerous relapses will be oticed. In regard to Dr. Thompson's question concerning e authorship of these probes, I would say that I am familiar ith Argyl Robertson's statement, but he gave no dates in nnection with Dr. Cooper's claim of priority and the ques-on can not be settled yet.

REPORT OF TWO CASES OF ACUTE GLAUCOMA.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

BY H. BERT. ELLIS, M.D.

LOS ANGELES, CAL.

On Jan. 11, 1895, there called upon me Mr. G. M., ged 51, a minister by profession, who gave the follow-ng history:

On January 8, while eating supper with his family, little piece of dry toast choked him and caused a oughing-spell, during which something seemed to nap in his right eye. Shortly afterward his eye be-came very painful and watered freely. The lids began o swell and the eye to become inflamed, and his reg-ular physician was called in, who gave him an atropin and cocain solution. As the swelling and redness continued to increase, he was referred to me by his physician. I found both the orbital and palpebral vessels very much injected, especially of the lower portion of the eye, the pupil very large, the tension slightly reduced, so that I thought that the dilation of the iris was the result of the atropin and cocain, but the use of a half per cent. solution of eserin failed to contract the same. The lens was dislocated down-ward and backward. Under a light pressure-bandage and rest for twenty-four hours, the lens regained its position, but the pupil was still irregular and large, the lower part of the lens cloudy. In so far as vision was concerned, that eye was almost blind, the patient only being able to distinguish light; the tension was slightly less than that of the other eye. On the 18th, he could distinguish the form of objects; on the 25th he could notice individuals, but could not tell their features. On this date, the patient was free from pain, the swelling of the lids had almost entirely gone, and the injection was greatly diminished. I tested the vision of the left eye and found it to be 3/40, which was brought up to 6/7 by a + 5.5 spheri-cal, combined with a + .5 cylinder at 180 degrees, and he could read number .50 D, with an addition of + 3 spherical. On February 1, the lens was quite cloudy. The tension had increased and the cup was glaucominous; vision entirely gone. I saw the patient frequently during the spring, kept him upon eserin and mild astringent drops, and there was no material change in his condition. I corrected the error of refraction of his left eye and cautioned him in regard to the use of the same. On October 29 my notes say: Lens clear, slight haziness of cornea; tension normal. Disc cupped, with the vessels passing over the edge and disappearing. I warned the patient to be very careful about using his eyes, that he might have a similar attack with his remaining useful eye, and requested that on the first intimation of pain he report. I saw him occasionally during 1896; the ten-sion slightly increased in right eye as time went on. He was doing his pastoral work faithfully, but ab-stained from reading more than he absolutely had to. On April 5, 1897, he came to my office, being led by his wife, and gave the following report: For about a week he had been suffering from a severe cold in the head and, accompanying that, a slightly inflamed eye, which he thought, as the cold improved, would pass off. There had been considerable pain, and five days before reporting, he became almost blind, but was too miserable to report, and still clung to the idea that it was only inflammation and would soon pass off. I found the tension of the eye ball + 3, pupil very much enlarged, and the media so turbid that an ophth-almoscopic examination was unsatisfactory. I per-formed iridectomy at once, which gave him slight vision, that is, with a — 1 spherical glass, combined with a + 5 cylinder at 125 degrees, he could read 6/100, sufficient vision for him to get around among his parishioners and about the city.

Miss J. S., aged 24, came to me on the morning of Sept. 18, 1897, with her family physician, and gave the following history: On the evening previous, she had an acute pain in her right eye, followed by sud-den blindness. The conjunctiva was inflamed, with marked photophobia, increased tension and dilated pupil. I could elicit nothing as to previous history outside of her usual mode of life. Diagnosis, acute glaucoma. Treatment, immediate iridectomy. Satis-factory progress, and on November 4, with a + 2.75 spherical, combined with 4.5 cylinder at 130 degrees, it was 6/24; with a — 1 cylinder at 120 degrees and a 2.5 cylinder, she could see 6/20 +. On Dec. 8, 1897, I prescribed for her a — .75 spherical combined with a + 3.25 cylinder at 30 degrees, which gave her vision of 6/15.

This case is a typic case of acute primary glaucoma. The first case is peculiar, in the first attack, in having a partial dislocation of the lens as the primary cause of the glaucoma, whereas the attack with the second eye seems to have originated *de novo*, or at least was provoked by an acute cold.

I present these two cases in contrast, simply to illustrate the conditions that we have to meet con-stantly in private practice. There is nothing extra-ordinary in either diagnosis or treatment. One is typic, and one departs very materially from the usual conditions.

243-246 Bradbury Block.

A CASE OF HEREDITARY GLAUCOMA.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

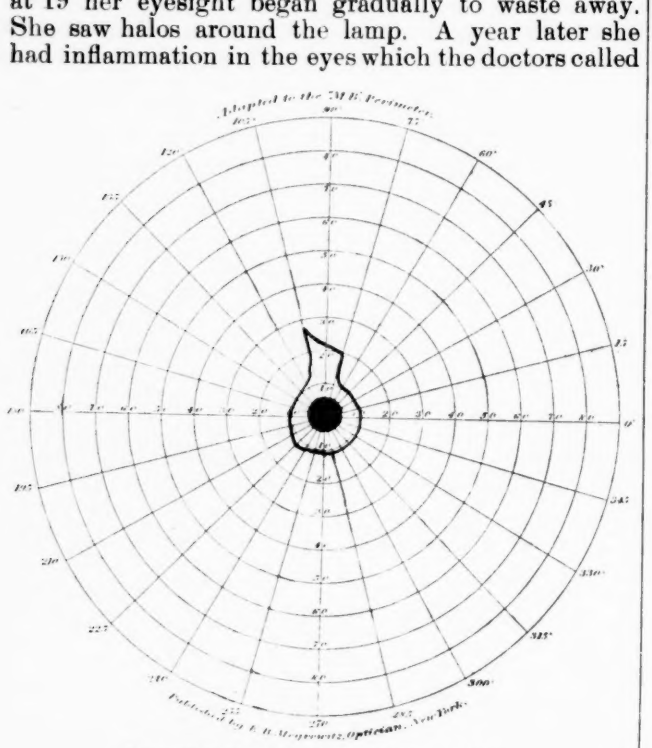
BY HERBERT HARLAN, A.M., M.D.

BALTIMORE.

Before this Section, at the New Orleans meeting in 1885, I reported a case of glaucoma, the patient be-ing one of the fifth successive generation in which the disease had appeared. That case, C. E. B., aged 17, consulted me in March of that year. The follow-ing is the family history taken from the previous re-port:

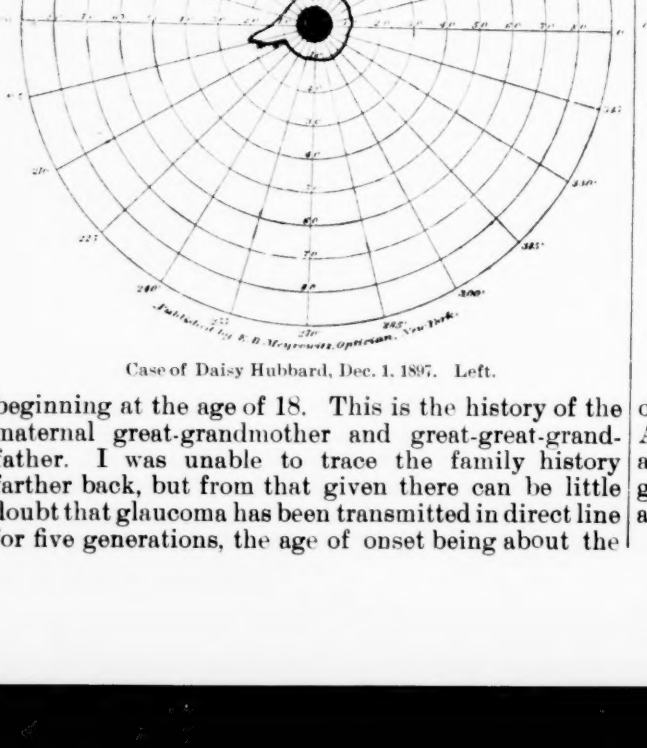
"Her mother, who accompanied her, is 49 years

old, and absolutely blind. Both anterior chambers are obliterated and the pupils closed. She states that at 19 her eyesight began gradually to waste away. She saw halos around the lamp. A year later she had inflammation in the eyes which the doctors called



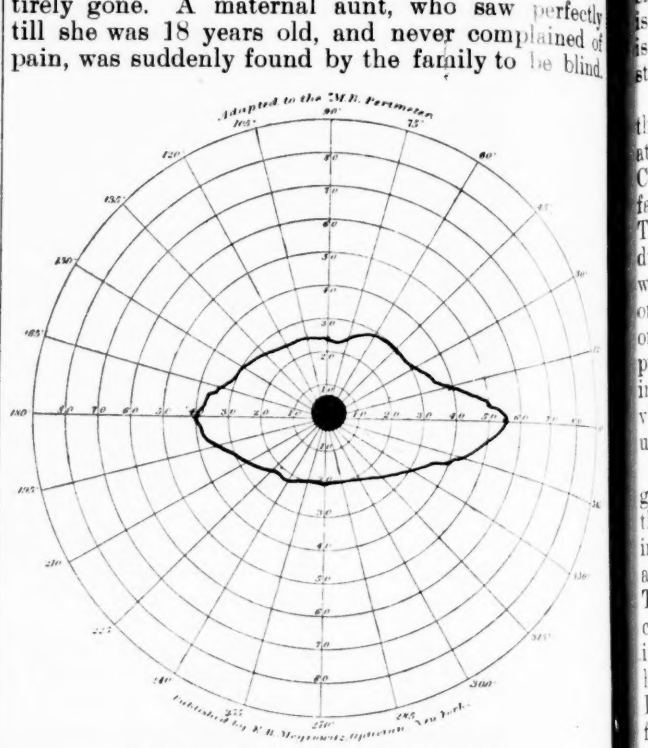
Case of Daisy Hubbard, Dec. 1, 1897. Right.

cold and treated with drops and blisters. After a while the eyes got better. Then another attack of inflammation came on, and she has been blind ever since. Never at any time was there much pain. The mother's father lost his eyes in the same way,



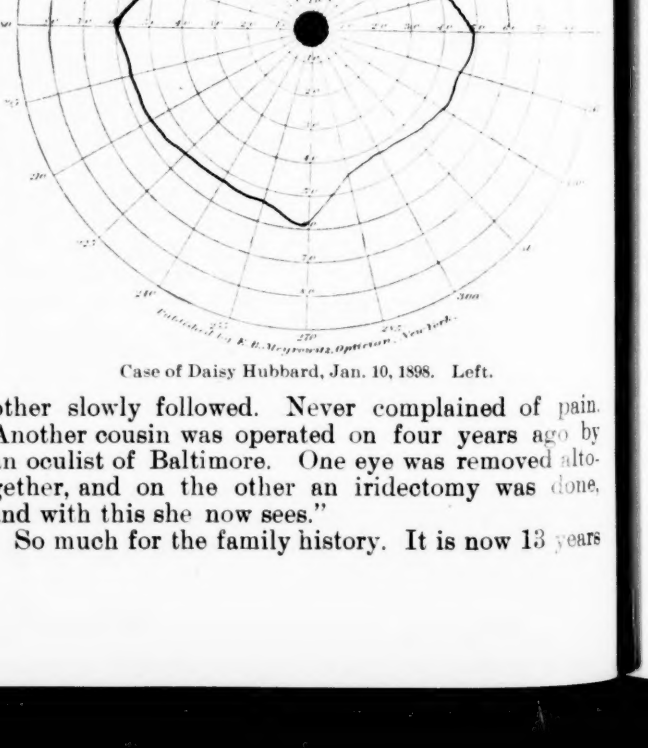
Case of Daisy Hubbard, Dec. 1, 1897. Left.

beginning at the age of 18. This is the history of the maternal great-grandmother and great-great-grandfather. I was unable to trace the family history farther back, but from that given there can be little doubt that glaucoma has been transmitted in direct line for five generations, the age of onset being about the same. A maternal uncle at 35 years had pain in his eyes and head, and in three years his sight was entirely gone. A maternal aunt, who saw perfectly till she was 18 years old, and never complained of pain, was suddenly found by the family to be blind.



Case of Daisy Hubbard, Jan. 10, 1898. Right.

(This was the mother of the patient whose case I am about to relate today.) Two uncles and an aunt, all over 55 years of age, see well. One cousin, now at a blind asylum, began to lose her sight at 16. Sight in the left eye was gone before it was found out. The



Case of Daisy Hubbard, Jan. 10, 1898. Left.

other slowly followed. Never complained of pain. Another cousin was operated on four years ago by an oculist of Baltimore. One eye was removed altogether, and on the other an iridectomy was done, and with this she now sees."

So much for the family history. It is now 13 years

since double iridectomies were done on C. E. B. and she still retains her eyesight. She has married and is the mother of four children, all boys, so that there is a good prospect of the disease being reported in still another generation at a later date.

On Dec. 1, 1897, Daisy H., a first cousin of C. E. B., their mothers being sisters, as above stated, appeared at my clinic at the Presbyterian Eye, Ear and Throat Charity Hospital. Her sight was said to have been failing for two years. Central vision was 20/30 each. The fields were extremely contracted. Pupils slightly dilated. T. + 1. Discs deeply cupped. Eserin was instilled, and next day an iridectomy was done on the right eye. A week later the same operation on the left. January 10 there was a very great improvement in the fields, as shown in the accompanying diagrams, although at that time the central vision was not so good. She left the hospital January 28.

A letter received May 25. says she has improved greatly; that she has no trouble with the eyes; that they are very strong; that she can see well. This interesting family is of French Huguenot stock, and are known in their county as the blind le Comptes. There is a tradition that a black-eyed woman, on account of some real or fancied wrong, cursed the family, and since that time all the dark-eyed children have gone blind—those having blue eyes escaping. It happens that the eyes of Daisy H. are blue. As far as I have been able to learn all the other glaucomatous eyes in this family are dark. It would seem that the cases yield readily to treatment by iridectomy.

DISCUSSION ON PAPERS OF DRS. ELLIS AND HARLAN.

Dr. J. L. THOMPSON, Indianapolis—Acute glaucoma may be a primary or secondary affection and requires to be treated accordingly. When there are no complications an iridectomy is preferable to all other modes of treatment, but I have seen cases where there is great chemosis of the conjunctiva with irido-choroiditis or cyclitis, in which leeches and hot fomentation had to precede the operation which, after a few days, has been done with the happiest results. I recall a case of acute glaucoma which accompanied retinitis albuminurica. This also was relieved by the above methods and eventually passed off, but the patient died about four weeks later of Bright's disease.

True hereditary glaucoma I have met with but once. This occurred in a girl 11 years old, whose father had undergone extensive operations for caries and necrosis of the parietal bones of specific origin. The child had the characteristic Hutchinson's teeth. She had suffered from chronic glaucoma for over six months before I saw her. The optic discs were very much cupped and the veins pulsating. Eserin was used for a few weeks, but she became worse, tension +2 with vision below $^{22}/_{100}$. I made an iridectomy upon each eye which was followed on the fourth day by a hemorrhage into the left anterior chamber, and on the sixth by the same in the right anterior chamber. These hemorrhages recurred several times inside of three weeks, which very much alarmed me. But she finally recovered with V. $^{20}/_{100}$ in one eye and $^{2}/_{70}$ in the other. She has had no trouble since.

Glaucoma and detachment of the retina.—Three months ago an attorney at law, aged 30 years, consulted me on account of his right eye, which became blind suddenly in childhood, but which gave him no trouble until a few months ago, when it caused a dull aching about the brow and temple. I found an extensive detachment of the retina about the lower outer and inner parts of the disc, with a portion upward which was not detached. This portion showed several pigmentary patches along the sides of the branches of the retinal vessels. Tension +3, vision, right eye 0, left eye $^{20}/_{20}$. I gave him a weak eserin solution and advised him to call on me again, which he has not yet done.

We are still on a sea of doubt as to the cause of this hardening of the globe. We have been inclined of late to lay too much stress upon the iritic angle and the spaces of Fontana. Many of us have met with cases in which the anterior chamber has become unusually deep after cataract operations, and still the hardness of the eyeball has gone on increasing until sight has been destroyed. I have met with one case of congenital absence of the iris and yet the eye was lost from glaucoma. Iridectomy is still the most reliable remedy in a majority of cases, and still we have to deal with some chronic cases in which contraindications to operative interference obtain. In many of these I have saved the sight for years by eserin in very weak solution and by massage of the eyeball. Just how an iridectomy benefits a patient we know no more than we did when its illustrious originator wrote concerning it. His last words on the subject apply to this day just as well as then. Said he: "No progress of importance has been made in respect to the theory of the operation, notwithstanding many attempts. Old hypotheses are usually dragged forth, little as they avail for the explanation of existing facts. The unhappiest of all, the one referring the effect simply to the wound of the ocular capsule, is periodically brought forth, decked in some new formula and recommended for adoption. Fortunately for our patients, practice advances independently on the foundation of empiric principles. No doubt some day a satisfactory theory will be found, but in the meantime we must not be led away by transient hypotheses."

Dr. GEO. M. GOULD, Philadelphia—I wish to give my experience with one of several cases of glaucoma that may be instructive to some, for it certainly was to me. An old Quaker lady came to me three years ago, after having had one eye operated upon for glaucoma, and the operation having been a failure in that the iris was almost completely torn from its attachment. The pain had been lessened, but the tension, +2, remains until this day. At the time she visited me the other eye had become quite hard and she was much frightened. Her experience had been so sad with the operation that she refused to consider another, nor would she listen to anything like enucleation of the bad eye. At that time I had also been trying massage, as Dr. Thompson speaks of, and instructed her how to carry it out – for I believe the success of the treatment depends largely upon the delicacy of touch of the patient. Despite the bad outlook in this case she now has perfect vision in that eye. Massage has to be kept up at intervals according to the degree of tension of the globe, which shows a constant tendency to harden.

Dr. J. O. MCREYNOLDS, Dallas—About five years ago a patient came under my observation who had been operated upon for glaucoma two months previously. The operation was an iridectomy and the eye was lost with subsequent development of very intense inflammation of the eye and it became necessary to enucleate. She got along very well, but had repeated attacks of glaucoma in the other eye. Just as has been the result in Dr. Gould's case, she now has perfect vision and the treatment I employed has been massage and the repeated instillation of small doses of hydrochlorate of pilocarpin, combined with appropriate internal medication. She has become so skillful in the detection of the early symptoms that she can make a diagnosis of its approach and she will carry on the massage and instillation of the pilocarpin until the tension comes down to normal. One other feature I wish to mention is with regard to some of the exciting causes of glaucoma. A patient was brought to me some time ago completely blind in both eyes as the result of glaucoma. He had lost one with glaucoma and after several months he went to an oculist for

the purpose of having a pterygium removed from the good eye. The operation was done and within two hours an acute, fulminating glaucoma developed in that eye, resulting in complete loss of vision. I wish to bring out the point of danger in making any kind of an operation upon an eye that is predisposed to glaucoma. It may have occurred in this case from the cocain, the operation, or the mental impression produced upon the patient, which I am quite sure has much influence in these cases.

Dr. HOLMES—I would like to ask Dr. Gould how often he advises the massage?

Dr. GOULD—Just as often as the tension goes above normal. The manner of massage is, in my estimation, of importance, that is, the rubbing must be very slow and clear around the outer edge of the eye. You can make great pressure if you will only go slowly and make no quick movements.

Dr. J. E. MINNEY, Topeka—I was recently called to a case of glaucoma where I desired to do an iridectomy, but they refused. I inquired into the history of the case and ordered quinin. The homeopathic physician who was in attendance said that he had put the patient on quinin and that he was giving five grains every four hours. This treatment was continued and the patient was cured. It was a case of malarial glaucoma. I never thought so much about glaucoma until two years ago, when the pastor of a little church in Kansas was stricken with total blindness. He called for the family physician because of the pain, and the physician injected morphin, which gave temporary relief. He came to me in April, two months later, with the right lens dislocated into the anterior chamber, high tension and much pain. The eye was enucleated, and he did well. He returned to his charge, but six months later I had to remove the other eye. It is the saddest case that ever came under my observation. I think if those who are teaching medical students can only teach them two things, that is, to recognize iritis and glaucoma, they will be amply repaid.

Dr. C. D. WESCOTT, Chicago—I would like to ask Dr. Gould, or others who have used massage, if they succeed in preserving the fields as well as the vision in these cases? I have had a patient under treatment for two years whose vision has remained $^{20}/_{30}$, and whose tension is kept down, but the field has gone on contracting.

Dr. GOULD—The field in the several cases I have had, and especially the one I referred to, remains normal, but I have only tested her with the finger for the past year.

Dr. THOMPSON—Some of my patients, in spite of the massage, have gone blind, but so have some of my iridectomy cases. A great many cases have been benefited and the field has not contracted, but in spite of any treatment you will have some of the patients go blind.

THE FIELD OF BINOCULAR FIXATION OR THE HOME OF THE GUIDING SENSATION OF THE RETINA.

Presented to the Section on Ophthalmology, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY G. C. SAVAGE, M.D.

PROFESSOR OF OPHTHALMOLOGY IN MEDICAL DEPARTMENT VANDERBILT UNIVERSITY.

NASHVILLE, TENN.

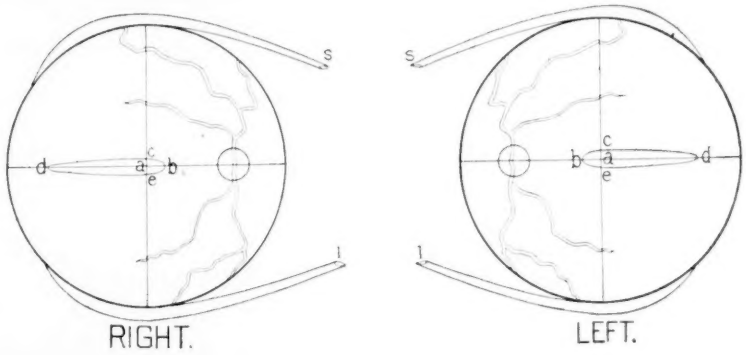
A private letter from Dr. Francis Valk of New York has led me into a further study of the guiding sensation of the retina. In my book "New Truths in Ophthalmology," I have emphasized its importance as master of the extrinsic and intrinsic eye muscles, but it seems to me now that I did not place enough emphasis on it. The part of Dr. Valk's letter which has led me to undertake this communication is as follows: "I have been reading your book lately and have been very much pleased with the work; but as I have read it a question has come into my mind that I want to ask you about. I note that in your chapter on Accommodation and Convergence, you lay great stress and importance on the guiding sensation of the eyes, and there I agree with you; but if this function is so important, and I believe it is, then may I ask: Of what value is any test for the power or balance of the ocular muscles that deprives the eyes of this most important function? In my own mind I am convinced that we must treat our cases of muscular difficulties according to nature's demands on the eyes, and we must not deprive the eyes of their most important function to understand their balance."

For many years I have taught my classes in the Medical Department of Vanderbilt University that, if we had but one eye, there would be no need for the extrinsic ocular muscles; that all of these muscles exist that there may be binocular single vision. In simplifying the study of these extrinsic ocular muscles I teach that the recti, in the final results of their action, are concerned only with the visual axes; that the superior and inferior recti, if acting in harmony, will keep these visual axes in the same plane, and that the lateral recti muscles will so control these axes as to make them intersect at the point of the object to be fixed.

I believe further that, if these recti muscles could thus control the visual axes without effecting any other change, there would be no need for the oblique muscles in eyes not affected by oblique astigmatism. Because of the fact that the inferior recti can not depress the eyes without, at the same time, effecting divergence above of the vertical meridians of the eyes, and the superior recti can not elevate the plane of the visual axes without, at the same time, converging above the vertical meridians, the necessity for the oblique muscles in all eyes for counteracting this torsion is at once made clear; hence I have always taught that the oblique muscles exist for the purpose of keeping the naturally vertical meridians parallel, which I have termed the simple function of the obliques. But in oblique astigmatism, with the meridians of best curvature converging or diverging above, the obliques are forced to perform their complicated function, which is to slightly converge or diverge the naturally vertical meridians. Therefore the common function of all the extrinsic ocular muscles is the production of binocular single vision. I believe these muscles are subject to one common master, which I have termed the guiding sensation of the retina. I believe that the home of this guiding sensation in the retina can be outlined, and that within this area the guiding sensation, in a normal condition of the ocular muscles, has the complete mastery of them all. I believe its throne to be the fovea centralis of the yellow spot of Soemering, and that its scepter sways over an area of the retina somewhat of the shape outlined in the accompanying cut.

An image displaced 4 degrees to the nasal side of the macula by means of an 8-degree prism marks the inner boundary of this area; and, that vision may not be doubled, the guiding sensation commands the external rectus to abduct the eye so that the macula may be brought under the displaced image. An image displaced to the temporal side of the macula 15 to 20 degrees, by means of a prism of 30 or 40 degrees, practically marks, on the horizontal retinal meridian, the

temporal limit of this area. To prevent double vision the guiding sensation can command, through the brain that the eye be abducted so as to bring the macula under the displaced image. Likewise a displacement of an image on the line of the vertical retinal meridian 1½ degrees above or below the macula by means of a 3-degree prism, base up and down respectively, would mark the upper and lower boundaries, on this meridian, of the retinal space constituting the domain of the guiding sensation. To overcome the diplopia the guiding sensation only has to call into activity the muscles that will depress and elevate the eye. Beginning at the nasal limit, *b*, a line drawn through the upper limit, *c*, thence through the outer limit, *d*, thence through the lower limit, *e*, thence back to the inner limit, *b*, encloses this retinal space. An image displaced anywhere within this space in one eye, without any displacement in the other, can be fused with the non-displaced image in the fellow eye at the command of the guiding sensation, the proper muscle



always responding to the call. Images displaced without this area can not be fused and no attempt is made at fusion, the guiding sensation having learned that its commands under such a condition will not be obeyed, or that it has no existence without this area. It remains, nevertheless, a fact, that some eyes with abnormal condition have a smaller retinal area for the effective work of the guiding sensation, while in others, in which the extrinsic muscles are of more than what is considered normal strength, this area is larger. Therefore it may be stated that, in individual cases of heterophoria, this area will have its own shape, differing from that represented in the cut. The drawing is intended to represent eyes whose abduction is 8 degrees, whose sursum and deorsum duction is 3 and whose adduction is from 30 to 40 degrees. Between the lines, it may be stated here, that the diplopia which would be effected by a torsion of the eyes by the superior and inferior recti muscles, and the diplopia caused by oblique astigmatism, are each counteracted by the oblique muscles in obedience to a command from the guiding sensation.

If this teaching as to the guiding sensation be true, what should constitute the methods of examination to determine the condition of the extrinsic eye muscles? It should be granted in the beginning that, if there is orthophoria of all of these muscles, the visual axes and the vertical meridians will bear the correct relationship to each other, although the vision of one eye may be excluded by means of an opaque disc interposed. No test for heterophoria can be fully relied upon, unless the displaced image in one eye is thrown entirely without the retinal area occupied by the guiding sensation; for the eye under test should be taken wholly from under the control of the guiding sensation that the eye muscles might place the eye in the position of equal tension of all of the eye muscles, which means the position of rest. There should be no displacement of image in the other eye.[1] At once it would appear that the test by means of Maddox' rod could not be the best, for, in some part, the streak of light must invade the domain of the guiding sensation, necessitating some sort of effort on the part of the guiding sensation to effect the fusion of some part of the false image with the true. For lateral heterophoria it would seem that a prism sufficiently strong to throw the displaced image entirely beyond, either above or below, the outlined area would be a *sine qua non*. This would take, unquestionably, the lateral muscles from under the control of the guiding sensation when the eye under test would swing itself into a position of equal tension of the externus and internus, thus causing the displaced image to stand to the right or to the left of the vertical plane of the true object. The distance should be measured by prisms and that measurement would show the quantity of the lateral error, whether esophoria or exophoria. Likewise, in testing for vertical heterophoria the image in one eye should be displaced to the nasal side of the macula, entirely beyond the retinal area under the control of the guiding sensation, when the eye, no longer under the control of the guiding sensation, would be elevated or depressed so as to give equal tension to the two vertically acting muscles. The measurement of the elevation or depression should be taken in the usual way by means of prisms, and thus could be reached a correct understanding as to the quantity of the hyperopia or cataphoria of that eye.

Objection to the double prism test would appear to be that one of the displaced images might fall within the retinal area of the guiding sensation and hence might lead to some error; but if the prisms are sufficiently strong both images can be thrown so far outside of this area as to make the test perfectly reliable.

After having made the test for ascertaining the balance or imbalance of the eye muscles, the intrinsic power of the recti muscles should always be taken. By this it is meant that prism after prism should be used up to the point where fusion is no longer possible. If a case has been found to be orthophoric and the abduction is 8 degrees, and the sursum and deorsum duction each 3 degrees, no condition could be more desirable. This test would show that, within the area under control of the guiding sensation, images can be easily fused by means of obedience on the part of the

[1] The author has just now (September 24) perfected a phorometer on this principle.

extrinsic muscles to the command of the guiding sensation. Again, suppose that a case has been found to be exophoric and the abduction is only 8 degrees, or less, there is at once a clear indication for doing nothing at all to the external rectus muscle of either eye, but the attention, in such a case, should be turned to the interni, and the condition should be corrected either by exercise of these muscles or by shortening one or both of them.

While the phorometer will always show the kind of heterophoria with which we have to deal, the duction test should always be relied upon as a correct guide in our efforts to bring relief.

DYNAMICS OF THE EXTRINSIC OCULAR MUSCLES.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY FLAVEL B. TIFFANY, M.D.

KANSAS CITY, MO.

Some years ago, when I became especially interested in the subject of the dynamics of the extrinsic ocular muscles, I read and reread the chapters on this subject. As the subject to me at that time was abstruse and puzzling I tested repeatedly the strength of the ocular muscles in my own case, and as I could only get a fractional amount of prism dynamics compared with that given in the books I concluded that mine was an exceptional case, that the strength of my extrinsic ocular muscles was greatly below the normal; but when I began to test some of my patients and found that their abduction as a rule only amounted to 6 or 8 degrees, while the adduction rarely exceeded 20 or 30 degrees, which was much less than was stated in the text-books, I began to think that there was some mistake. Either I had not thoroughly comprehended the subject and had used different methods or else the statements in the books were misleading. But it was not until Dr. J. M. Banister, major and surgeon U. S. A., read his paper that I was fully persuaded to make a more careful search in the subject.

Last winter I examined 100 medical students (seniors) who were fully impressed with the importance of giving eqact answers that the real conditions might be obtained. The examinations were carefully made with square prisms, Stephens' phorometer, Maddox rod and double prism test. My associate, Dr. George E. Bellows, assisted me in making the tests and compiled the tables following.

POWER OF ABDUCTION.

No. of cases:	1	1	18	20	32	5	14	2	2	1	1	1	1	1=100
No. of degrees:	0	3	4	5	6	7	8	9	11	12	13	14	15	18

Unusual cases as regards relative powers.

A.—Abduction greater than adduction:

Case, No.	Add.	Abd.	Condition.
51	8°	13°	
35	6°	8°	
41	6°	12°	
65	8°	11°	Exophoria.
70	5°	7°	
81	6°	8°	

B.—Abduction equal or nearly equal to adduction.

Case, No.	Add.	Abd.	Condition.
6	6°	6°	Exophoria.
44	6°	4°	Orthophoria.
52	10°	8°	Exophoria 8°.
77	6°	6°	Exophoria.
79	6°	6°	Orthophoria.
94	8°	8°	Exophoria.

Average power of adduction, 19°; average power of abduction, 6.26°; average power of sursumduction, 2.45°; average power of deorsumduction, 2.16°.

POWER OF ADDUCTION.

10 degrees and under	17 cases
10 to 20 degrees.	51 cases
20 to 30 degrees.	22 cases
30 to 40 degrees.	6 cases
50 degrees and over	4 cases

Age.	Color of eye.	Vision. R.	Vision. L.	Myopia.	Hyperopia.	Astigmatism.	Esophoria.	Exophoria.	Catophoria.	Hyperphoria.	Orthophoria.	Adduction.	Abduction.	Sursoom.
26	Brown..	20 20	20 20			H 1/4		1/2				22	9	2
39	Blue..	20 20	20 20								Yes.	14	6	0
33	Blue..	20 20	20 20				2					64	4	
27	Blue..	20 20	20 20			H 1/2					Yes.	26	8	0
25	Grey[1]..	20 80	20 70			M					Yes.	18	4	0
34	Blue..	20 20	20 20			H 1/2	1					6	6	3
28	Blue..	20 20	20 20								Yes.	14	9	4
24	Brown..	20 40	20 40			H 3/4 in 90 deg.	1					15	5	4
24	Brown..	20 30	20 40			H 1/2 in 180deg					Yes.	9	3	3
27	Brown..	20 20	20 20					1				12	5	2
27	Hazel..	20 30	20 30			H 1/4		1 1/2				16	6	
41	Blue..	20 20	20 20				1					20	4	2
21	Blue..	20 20	20 20				2					32	3	1
21	Blue..	20 20	20 20				1					12	4	4
25	Brown[2]..	5 180	20 20								Yes.	10		
27	Brown..	20 30	20 30			H 1/2	2 1/2					26	4	3
26	Brown..	20 50	20 50			M 1		1/2				10	7	3
26	Blue..	20 20	20 20								Yes.	15	8	4
29	Blue..	20 30	20 30			M 1/4					Yes.	14	6	4
23	Blue..	20 20	20 20					1/2				15	5	
25	Blue[3]..	20 30	20 30				2 1/2					16	6	2
24	Blue..	20 40	20 40	1/2			2 1/2					15	8	4
37	Brown..	20 20	20 20				1 1/2					24	5	4
28	Brown..	20 30	20 30		1/4						Yes.	23	8	3
34	Hazel..	20 20	20 20				2 1/2					23	6	2
26	Brown..	20 30	20 30		1/4		1					15	5	1
25	Grey	20 20	20 20								Yes.	24	8	1
27	Grey[4]..	20 100	20 20							1/2 R		20	5	2
28	Brown..	20 20	20 20							1/2 R		24	8	4
26	Brown..	20 20	20 20								Yes.	23	8	1
32	Blue..	20 20	20 20				1/2					21	4	2
26	Blue..	20 20	20 20				1		0			15	4	2
36	Grey	20 20	20 20								Yes.	29	6	2
40	Blue..	20 20	20 20								Yes.	21	4	2
26	Grey	20 20	20 20				1					6	8	3
31	Blue..	20 30	20 30	1/4			1/2					12	7	2
21	Blue..	20 20	20 20					1/2				12	7	3
24	Grey	20 20	20 20					2 1/2				16	6	3
29	Grey	20 30	20 30		1/2			2 1/2		R 1/2		29	6	3
24	Brown..	20 20	20 20								Yes.	11	5	2
35	Brown..	20 20	20 20					4				5	12	3
30	Brown..	20 20	20 20				1 1/2					24	6	2
35	Grey	20 20	20 20				1 1/2					17	4	1
26	Brown..	10 160	10 160	2 1/2							Yes.	6	4	3
28	Hazel	20 50	20 80	Apparent M				1/2				20	4	3
58	Blue..	20 30	20 40		3/4			4		R2		12	4	3
31	Blue..	20 20	20 20								Yes.	11	5	3
29	Blue..	20 20	20 20				1					8	4	2
30	Brown..	20 20	20 20								Yes.	8	4	1
27	Brown..	20 30	20 30		1/4						Yes.	28	6	3
30	Grey	20 30	20 20		3/4			1/2		L 1/2		8	3	4
38	Blue..	20 20	20 20					6				10	8	3
28	Black..	20 30	20 20		1/2						Yes.	16	6	4
28	Blue	20 20	20 20								Yes.	12	8	4
21	Brown..	20 20	20 30								Yes.	14	5	1
35	Brown..	20 20	20 20								Yes.	40	5	1
28	Grey	20 20	20 20				1					32	5	2
23	Blue..	20 30	20 30		1/2		1					11	8	2
25	Grey	20 20	20 20		L 3/4			1/2				15	6	3
18	Blue..	20 20	20 30	1/2							Yes.	12	5	3
32	Blue..	20 20	20 20								Yes.	16	6	2
49	Brown..	20 100	20 100	2							Yes.	10	5	3
27	Blue..	20 20	20 20								Yes.	23	5	2
26	Blue..	20 20	20 20					1		R 1/2		26	6	2
24	Grey	20 30	20 30	1/2				1 1/2				8	11	2
21	Blue..	20 20	20 20								Yes.	15	6	3
28	Blue..	20 30	20 20			H in 180	2					20	6	4
23	Blue..	20 40	20 40		1			1 1/2				18	6	3
26	Blue..	20 20	20 20									40	5	4
22	Blue..	20 20	20 20					1				5	7	1
19	Brown..	20 20	20 20								Yes.	18	5	3
22	Blue..	20 20	20 20					1		L 1/2		29	4	1
21	Black..	20 80	20 80	50				1				12	5	4
26	Blue..	20 20	20 20				1/2					16	6	3
23	Blue..	20 20	20 20				1/2					20	5	3
24	Brown..	20 20	20 20								Yes.	20	5	2
21	Blue..	20 20	20 20					1/2				6	6	2
21	Brown..	20 20	20 20								Yes.	18	6	1
21	Blue..	20 20	20 30		1/4						Yes.	5	6	1
24	Blue..	20 30	20 30		3/4						Yes.	23	11	4
27	Blue..	20 20	20 20					1				6	8	2
21	Blue..	20 20	20 20					1				11	5	3
21	Brown..	20 30	20 60	M							Yes.	10	4	3
26	Blue..	20 20	20 20								Yes.	14	8	3
22	Brown..	20 30	20 20								Yes.	20	6	3
25	Blue..	20 30	20 30		1/4						Yes.	15	6	2
30	Blue..	20 30	20 30		1/2						Yes.	28	4	1
20	Brown...	20 30	20 30	1/4							Yes.	20	6	4
25	Brown...	20 20	20 20			H 1/4				R 1 1/2		12	6	2
24	Blue..	20 30	20 30		1/4					R 1/2		16	6	3
20	Blue..	20 20	20 20								Yes.	11	6	2
21	Blue..	20 20	20 30			H 1/2	1					50	4	1
21	Blue..	20 30	20 30			M 1/2					Yes.	16	6	2
20	Brown...	20 30	20 30			M 1/4		1/2				8	8	3
30	Brown...	20 20	20 20				2					7	8	4
19	Brown...	20 20	20 20					3 1/2				35	15	2
44	Blue..	20 30	20 30			H 1/4					Yes.	24	6	4
24	Grey	20 20	20 20								Yes.	18	4	2
29	Brown...	20 20	20 20		H 1/4		1			R 1/4		1	7	2
28	Brown...	20 20	20 20								Yes.	20	6	3
30	Hazel[5]	20 40	20 80		H		30+							

10 degrees and under, 17 cases.

No. of cases:	1	6	5	1	4
No. of degrees:	5	6	8	9	10

Orthophoria . . . . . 5 cases, 29.4 per cent.
Exophoria . . . . . 10 cases, 58.8 per cent.
Esophoria . . . . . 2 cases, 11.7 per cent.

10 to 20 degrees, 51 cases.

No. of cases:	2	8	2	9	8	8	1	6	7
No. of degrees:	11	12	13	14	15	16	17	18	20

Orthophoria . . . . . 25 cases, 49 per cent.
Exophoria . . . . . 9 cases, 17.6 per cent.
Esophoria . . . . . 15 cases, 29.4 per cent.
Hyperphoria . . . . . 2 cases, 3.9 per cent.

20 to 30 degrees, 22 cases.

No. of cases:	2	3	3	4	4	1	1	4
No. of degrees:	21	22	23	24	26	27	28	29

Orthophoria. . . . . 10 cases, 45.45 per cent.
Exophoria. . . . . 5 cases, 22.7 per cent.
Esophoria . . . . . 6 cases, 27.27 per cent.
Hyperphoria . . . . . 1 case, 4.5 per cent.

30 to 40 degrees, 6 cases.

No. of cases:	1	1	1	3
No. of degrees:	32	33	38	40

Orthophoria. . . . . 3 cases, 50 per cent.
Exophoria. . . . . 2 cases, 33.3 per cent.
Esophoria . . . . . 1 case, 16.6 per cent.

50 degrees and over, 4 cases.

No. of cases:	2	1	1
No. of degrees:	50	52	64

Esophoria . . . . . 4 cases, 100 per cent.

Emmetropia.	59 cases	Orthophoria . .	43 cases
Hyperopia . . .	16 cases	Esophoria	28 cases
Myopia.	9 cases	Exophoria . . .	26 cases
Astigmatism . .	16 cases	Hyperphoria. . .	3 cases
Total	100	Total	100

	Orthophoria.	Esophoria.	Exophoria.	Hyperphoria.	Total.
Emmetropia. .	**25** 42.2 per ct.	**17** 28.8 per ct.	**16** 27.1 per ct.	**1** 1.8 per ct.	**59**
Hypertrophia. .	**7** 43.75 per ct.	**5** 31.25 per ct.	**3** 18.75 per ct.	**1** 6.25 per ct.	**16**
Myopia	**5** 55.5 per ct.	**1** 11.1 per ct.	**3** 33.3 per ct.	**0**	**9**
Astigmatism . .	**6** 37.5 per ct.	**5** 31.25 per ct.	**4** 25 per ct.	**1** 6.25 per ct.	**16**
Total. . . .	**43**	**28**	**26**	**3**	**100**

In making the tests I sought the power of abduction, adduction, sursumduction and deorsumduction. I ascertained the exact condition of phoria, whether orthophoria, esophoria, exophoria, hyperphoria or cataphoria, especially for distant objects, or when the muscles were free from any static influence. In testing at the reading distance orthophoria prevailed. I took name, age, nationality, color of eyes and condition of refraction, and from the data obtained were formed the following tables.

Several others might be made, but these will suffice to show that we have been in error as to the real normal strength of the extrinsic ocular muscles; that this power has been placed much too high; that the text-books have been misleading and that the error in following editions should be corrected.

REFERENCES TO TABLE.

[1] Could not get exact degree of astigmatism.
[2] Blind in one eye.
[3] Could not bring vision to 20/20.
[4] Could not discover trouble with right eye.
[5] Could not find degree of esophoria.

DISCUSSION ON PAPERS OF DRS. SAVAGE AND TIFFANY.

Dr. G. C. Savage, Nashville—In reference to Dr. Tiffany's statement that abduction has been placed too high (at 8 degrees), I want to state that I believe he is in error. That we can have more or less abduction we all know, but where is the normal power? Is it at 1 degree or is it at 19 degrees? He did not tell us what was the condition of imbalance, whether esophoria or exophoria. There must have been a considerable amount of exophoria in some of his cases. How he can have a case with no converging power at all in a case not strabismic, and yet not be able to overcome an abducting prism of any extent, I do not know. To my mind, the most complicated study in ophthalmology is a study of the ocular muscles; but I have reached this conclusion, that the study of aduction, per se, does not amount to a row of pins. We can ignore it always, because it is such a variable thing. But this is not true concerning abduction, sursumduction and deorsumduction. I believe 8 degrees is the normal abduction power; and we are pretty well agreed that 3 degrees is practically normal for sursumduction and deorsumduction.

Dr. J. O. McReynolds, Dallas—I feel that the difference in results obtained by various observers will depend much upon the kind of instruments they employ. Dr. Tiffany, I understand, has used square prisms, and I believe that method will not give as accurate results as may be obtained with one of the various phorometers. The phorometer I employ is an extension of the idea advanced by Dr. Risley. I have had one made in which I have an arrangement with the ordinary appliances of the Stevens phorometer, spirit level, etc., and two cells containing the Risley prisms, so that I can get any degree of prismatic effect in any direction, and by increments that are infinitesimal. It enables me to get the abduction, adduction, etc., as well as the balance. I feel sure that before any operation can be made we ought to be in possession of all these facts as well as the constitutional condition of the patient.

Dr. B. Alex. Randall, Philadelphia—I would like to enter a word of protest as to the matter of making muscle tests, not only to the points brought forward by Dr. McReynolds as to the constitutional condition and the instrumental difficulties, but to insist that we shall begin by understanding the fundamental condition, which is the refraction of the eye. All tests of the muscles depend, primarily, upon the refraction, and with all due respect to Dr. Tiffany or any other man, when I hear of hosts of cases that are emmetropic, I am skeptical as to all the rest. I must say, as a result of my investigations, that true emmetropia is almost an unknown quantity, and the varying degrees of hypermetropia and other errors which are ignored in most of these cases, furnish the results and vitiate the conclusions drawn. I have yet to see one of the cases (of which Dr. Noyes has reported so many) of insufficiency of the sternal muscle. I have invariably resolved them into cases of hypermetropic convergence. It is impossible, sometimes, to do that at first under a mydriatic, no matter which one is chosen, or how vigorously it is employed, but if it be repeated long enough we will get true refraction, and until that is done, and too often it is not even attempted, or at best, normal vision or lack of palpably magnified ametropia is assumed to show emmetropia, we can not get the muscle balance.

Dr. Geo. M. Gould, Philadelphia—I want to add one word of hearty commendation to what Dr. Randall has said. I have made all these tests for eight years, and as a result of that experience, and of gymnastic exercises, I protest against this remark of our friend Dr. Savage, that the fact of adduction may be left out of consideration. To me, the question resolves itself into this: What is the proportion between abduction and adduction? and, furthermore, the existence of symptoms. I first correct all ametropia, and that correction is modified by the proportion between abduction and adduction, and after that if the symptoms do not disappear it is time enough to work upon the muscles. As to the method, what shall it be? I never, as yet, have had a case of exophoria in which I was not able to develop enough adduction power by gymnastics not only to relieve all symptoms, but to get such power of the eye that there is no difficulty in work. The proportion should be 1 to 3 or 4. I try to run the adduction in a case of say 10 degrees of exophoria to start with, and 10 degrees of adduction, up to 60, 70 or 80 degrees, and, if the symptoms do not disappear, to

100 or more degrees, until the eyes positively turn in, and there is sufficient power to do away with all discomfort. Esophoria I do nothing with, and I have never seen any one that could do anything with it. I have seen cases operated upon without the least result. I have one patient, a minister, with 20 degrees esophoria, yet he is working every day without difficulty, when his ametropia is corrected.

Dr. J. L. THOMPSON, Indianapolis—I think it is the rarest thing to find an orthophoric individual, and I think the normal condition of the muscles for distance is 1 or 2 degrees of esophoria. I believe that is the natural condition of man, just as it is natural for the flexor tendons of the hands to be under some tension.

Dr. SAMPSON—This question is of great scientific interest. But to the most of us that practice medicine the question is, what can we do for the patient? The more I read about it and try to apply it, the more apparent it is that the question of ductions and phorias has not yet been placed on a distinctly scientific and practical basis.

The methods of determining muscle balance are certainly at fault, and any one of them implicitly depended on will not infrequently lead one into error. Speaking of converging power, insufficient adduction is certainly responsible for much of the trouble with which we have to deal. I have noticed it particularly among school teachers of the female sex; they frequently have exophoria, the converging power not exceeding 10 degrees, while their work requires extensive use of the converging muscles. We frequently find them run down in general health and the whole muscular system short on endurance. They seem incapable of sustained muscular effort, and the converging eye muscles participate in the disability. In many of these cases examination of the urine will show markedly diminished excretion of total solids, and it is surprising to see the effect of copious water drinking and giving attention to the constipation which usually coexists; for as the general health improves, the power of adduction increases and ocular discomfort subsides, often without the use of any of the special means invented for cultivating ocular muscles.

The inclusion of patients of this class in the accumulation of statistics would manifestly lead to erroneous conclusions; and from what I have been able to observe it appears to me that any individual presenting muscle anomalies would be pretty thoroughly untangled before his phoria or faulty duction would be counted as an intrinsically local disturbance.

Dr. TIFFANY—The object of this paper was not to discuss the condition of heterophoria, but to establish a normal condition of the muscles, and that I think we have done by an examination of the 100 cases given. As I have said they correspond with the results reported by Dr. Bannister.

RECENT EXPERIENCE WITH ADVANCEMENT OF THE RECTI MUSCLES.

Presented to the Section on Ophthalmology at the Forty-ninth Annual Meeting of the Americaan Medical Association, held at Denver, Colo., June 7-10, 1898.

BY C. H. BEARD, M.D.

CHICAGO, ILL.

To review the several ingenious theories as to the causes of strabismus; to endeavor to dispose of the intricate and subtle anatomic and physiologic problems pertaining to the imperfectly known branch of ophthalmology; to discuss all the pros and cons concerning the relative merits of tenotomy and advancement, as well as of the methods other than surgical for the treatment of the affection, would be highly agreeable; such, however, is not my present intention. I have, from time to time, in the past stated my convictions in these matters, and shall on occasion, continue so to do, always striving meanwhile for something better yet, to offer in lieu thereof, not disdaining to iterate and reiterate in accordance with such poor light as we possess, for I believe the theme demands it. The subject of this paper was suggested to me by the worthy chairman of this Section, and in order to make my report systematic, I have tabulated from my private records about all of the strabismus cases that have come for consultation to my office during the past six years.

I have chosen to make the report from private practice because the statistics there are fuller and more available, though I hope ere long to give a compendium of results in this line, referable to the hospital and the dispensary, where the great bulk of my work in this department has been done. I shall attempt a partial summary: I found that out of the total number of cases that came for consultation in that time 214, or about 4 per cent. were cases of strabismus. These do not include paralytic nor latent squint. Of the 215 cases 142 were of the convergent variety, 70 were divergent and two were mixed, i.e., there was convergent strabismus in near vision, and divergence for distance. Six of the cases of divergence were secondary or operative ones.

Of the 142 convergence cases, in 74 the left was the squinting eye, 17 alternated, and in 51 the right eye turned. In 18 the squint was intermittent or periodic when first seen.

Of the 70 cases of divergence, in 29 the left eye deviated, in 15 the eyes alternated, and in 26 the right was the squinting eye. Ten of these were intermittent. I may remark in passing that in the beginning most of them are intermittent.

Of the 142 cases of convergent strabismus the refraction of both eyes was hyperopic in 114, both myopic in 6, antimetropic in 2, and emmetropic (or practically so) in 20.

Of the 70 cases of divergent strabismus the refraction of both eyes was hyperopic in 38, myopic in 16, mixed in 2, antimetropic in 3 and emmetropic in 11. Deducting the six secondary cases, gives us exactly twice as many cases of divergent strabismus associated with hyperopia as with myopia, a significant point in studying the causes of strabismus.

Of the 114 cases of convergent strabismus with hyperopia of both eyes the error amounted to three or more dioptrics in 63. Of the 6 cases of convergence with myopia the latter was three or more dioptrics in 4.

Of the 38 cases of divergent strabismus, associated with hyperopia of both eyes, the degree of the hyperopia was three or more dioptrics in 9 cases. Of the 15 cases of divergent strabismus with myopia in both eyes it was three or more dioptrics in 8.

Of the 214 strabic patients 78 were under 15 years of age, 101 between 15 and 30 years, and 35 were over 30. There were 129 females and 85 males. The angle of the squint, or, rather, the angle of the optic axis of the squinting eye to the right optic axis of the working eye ranged from 12 to 65 degrees.

Of the 214 cases 158 received treatment in some form. In many instances this began and ended with the fitting of a pair of glasses. Fifty-six were not treated at all, having come merely for examination and consultation. Out of the 158 patients treated 70 had one or both muscles advanced, the second muscle

NOTE.—Owing to the limited time, this paper was read by title and, at the request of the President of the Section, the allotted time was occupied by its author in describing his advancement operation. The accompanying discussion, therefore, has reference to said description.

having been brought forward in about 12 per cent. of the cases. The operation was for convergent strabismus in 70 of the cases, and for the divergent form in 20; or in other words, of 81 advancements on these 70 patients 57 were of the externus and 24 of the internus. The inferior rectus was advanced once after correction of the lateral deformity. Of all the advancements only three were for alternating strabismus, two convergent and one divergent alternating.

Of the 70 patients to have their strabismus corrected by advancement, just one-half the number had a high degree of amblyopia in the squinting eye, with fair to good vision in the fixing eye. Thirteen had 20/20 in both eyes. Thirteen had 20/30, and ranged from 20/30 to 20/50. This is the corrected vision. In the rest (2) the sight was not determined. The vast majority of patients who had advancement ranged in age from 15 to 30 years, that period of life during which the duty of looking one's best is most imperative.

In 32 cases the strabismus yielded to atropin and glasses; in nine more cases to glasses together with persistent and systematic orthoptic training with prisms, the stereoscope, etc. The corrected visual acuity in the 41 cases whose squint was righted by other than surgical means, amounted for both eyes in 18 instances to 20/20, in 15 to 20/30, and in 1 to 20/50. One eye was highly amblyopic in 5, and in 3 the sight was not definitely ascertained.

Thus, out of 158 cases treated in some measure a cure was accomplished in 111, leaving 47 who are either reporting from time to time or have wandered off. Were I not so strongly opposed to the operation of tenotomy, excepting for its effect in combination with that of advancement, I might not now have the satisfaction of reporting these 41 cures of strabismus accomplished without surgical interference, for I believe that the very ease and facility with which that operation is performed, and the comparatively little inconvenience to the patient which it occasions, has led to its abuse. We should not lose sight of the fact that surgery is only one of the means toward the end in question.

I find that, as time goes on, I make relatively fewer advancements on the other eye. Not that I have changed my views as to the beneficial effects of double advancement, but chiefly because of the difficulties or the obstacles in the way of bringing the patient to submit to the second operation. I have, therefore, in the more recent operations, been striving for greater effect at once.

Donders was unquestionably right in asserting that strabismus is essentially a binocular affection. The tests of motility and fixation in a vast majority of the cases will show limitation in the direction opposite to that of the squint in both eyes. Hence, were it practicable always to have one's choice in the matter, I believe it would be better to make a moderate advancement of the corresponding muscle in each eye, than to confine all to one. It is true, in one sense, that what we do toward changing the position of one eye is done also to the other, so that while it is feasible to correct the strabismus by operating on only one eye, the squinting eye, for instance, in the constant monolateral form, and on the worse eye, if there be a difference, in the alternating variety, I do not, however, regard the procedure as strictly scientific. The increased tension put upon a muscle by a properly gauged advancement is a means of putting new life and vigor into it, but there is a limit, beyond which the stretching of the muscle should not be carried. Even granting that we right the deformity by a single operation, and without drawing up the muscle too tightly, the improved tone of the operated muscle is only in a measure imparted to its fellow of the opposite eye, and the result is somewhat one-sided after all. For these reasons, when the faulty muscle of each is proven to be markedly inefficient, I give the patient plainly to understand that two advancements will be necessary. It will be observed that it is not so much the degree of the squint which is taken as the criterion for the extent of the advancement, as is the strength, or weakness, if you choose, of the offending recti, some of the very slight deviations often requiring a most decided moving forward of the tendon. Again, it is not uncommon to find that the eye which habitually squints is possessed of the better muscular system of the two. Under such conditions, the vision being equally good in both eyes, and only one operation being contemplated, it is good practice to make the advancement on the working eye. I would deem it advisable, always, where exists a pronounced difference in the strength of the faulty muscles, to allow this, and not the deviation, to determine which eye should be operated upon, were it not for the fact that the squinting eye is so often but poorly endowed with vision. It is the dread of that possible mischance. In careful hands there is no safer operation made than this, yet eyes have been lost from slighter things, and one can not ignore the possibility, be it ever so remote. Especially is this applicable in dispensary practice, where many irresponsible patients may be expected to go into homes and surroundings which are not calculated to favor the traditional "uneventful recovery," and to report back to the surgeon at their own sweet will.

In all of my experience, however, in the management of several hundred advancements on hospital and dispensary patients, I have had to contend with but one eye that gave any cause for uneasiness. It was that of a young man treated at the North Star Dispensary, who reported on the fourth day after the operation with suppurative tenonitis, beginning at the site of the advancement. He was put at once into the hospital, the thread removed, and by vigorous measures the process was arrested before anything really serious occurred. It will be observed that this operation means advancement in the true sense of the word, in that it gives a new insertion for the tendon, nearer to the cornea than the original one. Many of the so-called advancements consist merely of a shortening, inasmuch as they do not move the insertion at all. Even though a small section of the tendon may be removed, the quality of the operation is not altered. Often, in the early stages of healing, the tendon can be clearly seen firmly adhering to the globe forward of its former place of attachment. But to attempt to regulate to the millimeter the exact point at which this union of the tendon with the globe shall occur, as some operators assume to do, is surely an illusion. By exercising care in obtaining firm holds for the thread, both in the tendon and in the places of anchorage above and below the cornea, we may be confident of a positive and permanent advancement, but gauge it to a mathematical nicety we can not. As Landolt has neatly said, "Nature does it; *with* us, if we make use of her efficient help, *against* us if we neglect it." We must always allow for some dropping back by producing primary over-effect.

Number.	Age.	Convergent and which eye.	Divergent and which eye.	Other forms.	Degrees.	Vision at first visit. O. D.	Vision at first visit. O. S.	Corrected vision. O. D.	Corrected vision. O. S.	Refraction. O. D.	Refraction. O. S.	Treatment and result.	Remarks.
1	26			S'con'y	50	Fingers 2 in.	20/30	20/30	20/15	−1.5 cyl. ax. 165°	−1.5 cyl. ax. 90°	Advt. right internus; result perfect.	The capsule of T. was advanced with muscle.
2	26				40	20/30	4/200	20/20	12/200	+2 D.		Fitted glasses.	
3	22	O. S.			45; varies.	20/50	20/200	20/20	20/20	+1 s. ○ ; +2c. ax. 90°	−1.5 s. ○ ; +0.25c. ax. 120°	Advt. right externus; result perfect.	
4	17	After ᵍ			55	20/50	20/200	20/100	20/30	+3 s. ○ ; +2c. ax. 90°	−1.5 s. ○ ; +0.25c. ax. 120°	Advt. right externus; result perfect.	Three years later result still perfect.
5	23	O. D.			50	20/50	20/200	20/200	20/20	+3 s. ○ ; +2c. ax. 90°	−2	Fitted glasses.	
6	8	O. D.		Int'mit	Varies.	20/50	20/50	20/50	20/30	E.	E.	No treatment.	
7	8	O. S.			45	20/50	20/50	20/50	20/50	E.	E.	No treatment.	
8	6				50	8/200	20/50	8/200	20/50	E.	E.	No treatment.	
9	6			Int'mit	40	20/40	20/40	20/20	20/30	6.5 ○ ; +0.75 c. ax. 25°	+3	Fitted glasses.	Remains of hyaloid artery in right.
10	22			Int'mit	45	20/200	20/200	20/50	20/50	4.5 s. ○ ; +0.75 c. ax. 25°	+6	Fitted glasses.	Eyes straight with glasses.
11	30				50	20/50	20/40	20/20	20/50	2.25 s. ○ ; +0.50 c. ax. 45°	+7	Fitted glasses.	
12	20				40	20/50	20/200	20/20	20/30	2.25 s. ○ ; +0.50 c. ax. 135°	+6	Fitted glasses.	
13	44	O. S.			45	20/50	20/30	20/20	20/30	0.50 s. ○ ; +0.50 c. ax. 135°	0.50 s. ○ ; +0.5 c. ax. 90°	Pres. glasses.	Strabismus still exists.
14	49	After ᵍ			45	20/50	20/30	20/50	20/50	0.50 c. ax. 90°	+1.5	Pres. glasses.	
15	11		O. D.		50	20/50	20/50	20/30	20/30	+1.5	+4	Pres. glasses.	
16	16	O. D.			50	5/200	20/50	20/50	20/30	+1.5	+1.5	Advt. left internus; result perfect.	Upward squint also corrected by this operation.
17	30		✗ D.		50	20/50	20/50	20/50	12/200	0.50 c. ax. 180°	+3.5	No treatment.	
18	7		O. D.		55	20/200	20/70	20/70	20/70	E.	E.	No treatment.	Central absence of choroid in both eyes.
19	19		O. D.		45	20/50	20/200	20/50	20/200	7 s. ○ ; +1 c. ax. 90°	E.	Advt. left externus; result perfect.	
20	33		O. D.		50	20/50	8/200	20/50	20/200	E.	4.5 s. ○ ; +2 c. ax. 90°	Pres. glasses.	Later vision shows improvement.
21	17				50	20/40	1/200	20/100	20/100	3	E.	Iridectomy advised.	Closure of left pupil from injury.
22	57				Varies.	5/200	20/50	20/30	20/30	+5.5	+4	Pres. glasses.	
23	13½		✗ D.		45	5/200	20/50	20/30	20/30	0.75 s. ○ ; +0.50 c. ax. 180°	+5.5	Pres. glasses.	Eyes straight with glasses.
24	44		O. D.		50	20/40	20/30—	20/30	20/30	E.	+0.75 s. ○ ; +0.50 c. ax. 180°	Pres. glasses.	
25	32	After ᵍ			Varies.	20/20	20/20	20/20	20/20	1 s. ○ ; +2 c. ax. 45°	E.	Advt. left externus; result perfect.	
26	41		O. S.		45	20/100	20/70	20/70	20/70	0.50 s. ○ ; +0.50 c. ax. 75°	+2 c. ax. 135°	Pres. glasses.	Advised operation.
27	17	After ᵍ				20/50	20/200	20/20	20/20	+0.50 s. ○ ; +0.50 c. ax. 115°	+0.50 s. ○ ; +0.50 c. ax. 115°	Advt. left externus; result perfect.	
28	11		✗ D.		45	20/50	20/50	20/15	20/15	E.	E.	No treatment.	
29	21		O. D.		50	20/50	20/100	20/100	20/100	+2 s. ○ ; +2.5 c. ax. 125°	−1 s. ○ ; −1 c. ax. 90°	Pres. glasses.	Operations two months apart.
30	21		O. D.		45	20/200	20/200	20/50	20/50	2 s. ○ ; +2.5 c. ax. 125°	+2	Advt. both interni; result perfect.	
31	7				50	20/50	20/50	20/30	20/30	1.5 s. ○ ; +1 c. ax. 90°	+2.5	Advt. right externus; result perfect.	
32	21				45	20/50	20/50	20/200	20/200	2.5 s. ○ ; +1 c. ax. 90°	+4	Advt. right externus; result perfect.	
33	11				40	20/50	20/50	20/200	20/200	3.5 c. ax. 90°	+3.5 c. ax. 90°	Advt. left externus; result perfect.	
34	27				45	20/100	4/200	8/200	4/200	4	+4	Pres. glasses.	
35	27				35	20/200	20/50	20/40	20/40	1.5 s. ○ ; +1.5 c. ax. 90°	+2	Pres. glasses.	
36	7				50	20/40	20/50	20/50	20/40	2 s. ○ ; +2 c. ax. 90°	+2.5	Pres. glasses and massage.	
37	7				50	Perep. light	20/30	20/20	20/15	+1 s. ○ ; +0.50 c. ax. 135°	+0.50 s. ○ ; +0.50 c. ax. 90°	Advt. right externus; result perfect.	
38	35				50	20/30	20/30	20/30	20/30	+1 s. ○ ; +0.50 c. ax. 135°	+0.75 s. ○ ; +0.50 c. ax. 45°	Pres. glasses.	
39	40			Int'mit	45 in accom.	20/30—	20/30	20/30	20/30	+2	+2.5 s. ○ ; +1 c. ax. 85°	Advt. left externus; result perfect.	
40	19				40	20/70+	20/30	20/20	20/20	+2	+1	Pres. glasses.	
41	12				50	6/200	20/50	20/200	20/200	+2.5 s. ○ ; +0.50 c. ax. 90°	+2 s. ○ ; +0.50 c. ax. 95°	No treatment.	
42	33				45	20/50	20/50	20/50	20/50	2.5 s. ○ ; +0.50 c. ax. 90°	E.	No treatment.	
43	13½				45	20/50	20/200	20/50	20/15	E.	+6.5	Pres. glasses.	
44	33				50	20/30	20/50	20/30	20/20	+5.5	+3.5	Pres. glasses.	
45	39				Varies.	20/30	20/30	20/30	20/20	3	E.	No treatment.	
46	50				40	20/50	20/70	20/50	20/50	E.	+3	Pres. glasses.	
47	26				55	20/50	20/50	20/50	20/50	+3	+3	Pres. glasses.	
48	21				40	20/100	20/40	20/100	20/30	+3	+3	No treatment.	Advised to wait till child is older.
49	26				50	20/20	20/30	20/20	20/30	E.	E.	No treatment.	
50	57				50	20/20	20/30	20/20	20/30	E.	E.	No treatment.	
51	52			Int'mit	Varies.	20/70—	3/200	20/20	3/200	+4	+1	Pres. glasses.	Eyes straight with glasses.
52	43				55	20/30	20/30	20/30	20/30	+4	+2	Pres. glasses.	
53	8				55	20/30	20/200	20/30	20/200	+4	+2	Advt. left externus; result perfect.	
54	15				Varies.	20/40	20/50	20/20	20/30	1 s. ○ ; +0.50 c. ax. 120°	+2.5 c. ax. 75°	Pres. glasses.	
55	26				50	20/30	20/40	20/20	20/30	+2	+2.5	Pres. glasses.	One yr. later eyes straight with glasses.
56	17				50	20/30	20/30	20/20	20/30	+2	+2	Pres. glasses.	
57	46				20 and more.	20/30	20/30	20/20	20/20	+0.50 c. ax. 180°	+0.50 c. ax. 180°	No treatment.	
58	45		✗ S.		Varies.	20/50	20/50	20/20	20/20	+2	+2	Pres. glasses.	
59	24		O. S.		45	20/30	8/200	20/20	8/200	4 s. ○ ; +0.75 c. ax. 135°	+4	No treatment.	Four years after straight central coloboma left choroid.
60	22				50	20/30	20/30	20/20	20/30	E.	+5	No treatment.	
61	21				50	20/30	20/30	20/20	20/30	E.	E.	Straight under atropin.	
62	6				45	20/20	20/20	20/20	20/20	+4	+3.5	Advt. right externus; result perfect.	
63	4				35	20/20	20/20	20/20	20/20	+2	+3.5	Advt. left externus; result perfect.	
64	9				45	20/50	20/50	20/30	20/30	+3.5 s. ○ ; +1.5 c. ax. 90°	+3.5 s. ○ ; +1.50 c. ax. 90°	Advt. left externus; result perfect.	3 yrs. later eyes straight with glasses.
65	9				30 to 50	20/100	20/100	20/70	20/30	+15 D. aphakia.	+5 cyl. ax. 90°	Pres. glasses.	Traumatic cataract of rt.; removed before squint operation.
66	18				45	20/100—	20/30	12/200	20/30	+0.5 s. ax. 180°	+0.75 c. ax. 180°	Advt. right internus; result perfect.	
67	22		O. D.		50	20/50	20/40	20/15	20/20	15 D.	1.5	No treatment.	
68	28		O. D.		50	20/15	20/30	20/15	20/20	1.5	1.5	Advt. right internus; result perfect.	Last advt. made with curved tenotomy.
69	28				50	20/50	20/50	20/50	20/50	1.5	1.5	Advt. both interni; result perfect.	Left eye turned out, for upward deviation.
70	15½				50	20/50	20/50	20/50	20/50	E.	E.	Advt. both externi; result perfect.	Marked improvement of vision of right.
71	15½				50	20/50	20/50	20/50	20/50	E.	E.	Advt. left externus; result perfect.	Two years after operation.
72	8				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	Eyes straight with glasses.
73	8				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
74	15				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
75	26				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
76	17				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
77	46				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
78	45				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
79	24				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
80	22				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
81	21				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
82	6				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
83	9				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
84	9				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
85	18				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
86	22				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
87	15½				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	
88	8				45	20/50	20/50	20/50	20/50	4.5 s. ○ ; +1.5 c. ax. 90°	4.5	Pres. glasses.	

74	36	O. D.			50	20 100	20 70	20 20	20 20	−1.5		0.50s. ⊂ +1.75c.ax.105.	Advt. right externus; result perfect		
75	17		O. D.		45	4 200	7 200	20 70	20 70	−10		10	Pres. glasses		
76	7	Alter'g			Varies	20 20	20 20			+6.5		Pres. glasses		Eyes straight with glasses.	
77	17	O. D.			45	20 20	5 200	20 20	5 200	+1		2.5	No treatment		
78	8	O. S.			50	20 20	20 30			+1.75		1.75 s. ⊂ ; +1 c. ax.90.	No treatment		
79	3	Alter'g			Varies	20 20−	20 20	20 20	20 20	+1.35		4	Pres. glasses	Eyes straight with glasses.	
80	10		O. D.		40	0	20 20			E.		E.	No treatment	Congenital atrophy of rt. optic nerve.	
81	20	O. D.			50	20 100	20 20			E.		E.	Advt. right externus; result perfect.		
82	35	O. S.			35	20 20−	3 200	20 20	3 200	−0.5 c. ax. 90		−1.5	No treatment		
83	20	O. S.			35	20 30	20 40	20 30	20 40	+3.5		+4	Advt. both externi; result perfect.		
84	30	O. S.			60	20 20−	20 100	20 20	20 40−	+1.5		+1.5	Advt. left externus; result perfect.		
85	28		O. D.	S'con'y	45	20 70	20 20	20 20	20 10	+1 s. ⊂ ; +1 c. ax. 135.		+0.75s. ⊂ ; +0.50c.ax180	Advt. right externus; result perfect.		
86	16	O. S.			Varies	20 40	20 40	20 20	20 20	+5		+5	Pres. glasses	4 yrs. after eyes straight with glasses.	
87	28		O. D.		25 and more	4 200	20 30	20 40	20 20+	+5.5 s. ⊂ ; −1.5 c. ax.180		−0.75 c. ax. 180	Pres. glasses		
88	4	O. S.			45	20 20	20 30	20 20	20 20	+3.5		+4.5	Pres. glasses	5 yrs. after eyes straight with glasses.	
89	25	O. S.			20; varies.	20 30	20 70	20 20	20 40−	+2.5 s. ⊂ ; +0.5 c. ax. 90		+3	Pres. glasses	4 yrs. after eyes straight with glasses.	
90	42		O. S.		45	10 200	5 200	20 30	20 100	−16		−18	No treatment		
91	3½	O. S.			50	Good in rt.,	can see pen	ny in le	ft...	E.		E.	No treatment		
92	27		O. S.		40	20 20	Percep. light			E.			No treatment	Traumatic cataract in left eye. See note 1.	
93	12		O. D.		50	5 200	5 200	20 70	20 70	+10		+10	Advt. both interni; result perfect.		
94	16	O. S.		Int'mit	Varies	20 50+	20 50−	20 40	20 20	+3.5 s. ⊂ ; +2.5 c. ax. 60		+3.5 s. ⊂ ; +2.5 c. ax.120	Pres. glasses	Eyes straight with glasses.	
95	37	O. D.			53	20 200	20 30−	20 40	20 20	+4 s. ⊂ ; +1.5 c. ax. 90.		+4 s. ⊂ ; +1 c. ax. 78.	Advt. right externus; result perfect	Three years later result still perfect,	
96	43	O. S.			Varies	20 70	18 200	20 30−	18 200	+5 s. ⊂ ; +0.75 c. ax. 90		+5 s. ⊂ ; +1 c. ax. 90	No treatment		
97	33		Alter'g		Varies	20 30	20 30	20 20	20 20	+0.5 c. ax. 90.		+0.5 c. ax. 90	No treatment		
98	17-12	Alter'g			Varies					+4		+5	No treatment	Advised to wait till child is older.	
99	21	O. S.		Int'mit	40 to 50	20 70−	20 70	20 30	20 20−	+1.5 s. ⊂ ; +2.5 c.ax.102		+2.5 s. ⊂ ; +2.75 c.ax.82	Pres. glasses		
100	5	O. S.		Int'mit	45 to 50					+4		+5	No treatment		
101	22	O. D.			12 to 20	20 30	20 30	20 20	20 20	+2		+2	Advt. right externus; result perfect	Tenotomy of both interni 5 yrs. ago for esophoria.	
102	27	O. S.			20 to 50	20 30−	20 200	20 20	20 50	+3		+3.5	Advt. left externus; result perfect.		
103	18	O. S.			45	20 70−	20 70	20 30	20 3	+6 s. ⊂ ; +1 c. ax. 90.		+6 s. ⊂ ; +1.5 c. ax. 90	Advt. left externus; result perfect.		
104	25		O. S.		50	20 50	20 200	20 20	20 20	−1.5 c. ax. 90		+1.5 c. ax. 30	Advt. both interni; result perfect.		
105	8	O. D.			45	20 70	20 30−	20 70−	20 15	+4		+5	Pres. glasses	Still considering operation.	
106	18		O. S.		20	20 30	20 30−	20 20+	20 20	+3 s. ⊂ ; +0.75 c. ax. 95		+4 s. ⊂ ; +0.75 c.ax. 65	Advt. both interni; result perfect.		
107	29	O. S.			45	20 20	20 30	20 20	20 30	+4		+4	Advt. left externus; result perfect.		
108	5½	Alter'g		Int'mit	35 and more	20 200	20 200	20 20	20 30	+3.5		+3.5	Pres. glasses	5 yrs. later eyes are straight, w. glasses.	
109	23	O. D.			50	1 200	10 200	1 200	24 40−	−5		−6 s. ⊂ ; −2 c. ax. 180.	Pres. glasses		
110	21		O. D.		20	20 20	20 20	20 20	20 20	+0.5 c. ax. 125.		+0.25 c. ; ax. 90	Advt. both interni(?); result good.		
111	12	O. D.			20	20 30	20 30	20 15	20 15−	+0.75		+0.75	Pres. glasses and prism gymnastics	5 yrs. after eyes are straight, w. glasses.	
112	15		O. S.		12 to 35	20 20	20 40	20 20	20 30	+0.5 s. ⊂ ; +0.5 c. ax. 90		+2.5 s. ⊂ ; +1 c. ax.105	Pres. glasses	Apparent correction of strabismus with glasses.	
113	38		O. D.		45	20 200	20 40−	20 200	20 20	−1 c. ax.10		−0.75 c. ax. 170	Pres. glasses		
114	23		O. D.		50	20 40	20 30−	20 30	20 20	+0.5 c. ax. 45		+0.5 c. ax. 135	No treatment		
115	7	O. D.			25	20 50	20 30−	20 30	20 20	+0.5 s. ⊂ ; +1.5 c. ax. 90		+1 s. ⊂ ; +1.5 c. ax. 90	Pres. glasses	Eyes are straight with glasses.	
116	32	O. S.			50	20 20	20 50			E		E	No treatment		
117	23		O. D.	Int'mit	25 to 35	20 30	20 30+			E		E	Advt. right internus; result good		
118	34	O. D.			50	20 200	20 40	20 50−	20 20−	+6		+4 s. ⊂ ; +0.75 c. ax. 90	Pres. glasses	Squint still exists.	
119	27		O. S.		45	20 70	3 200			E		E	No treatment for strabismus	Old corn. opac. from interst. keratitis.	
120	5	O. S.			45 to 50	20 20	20 70	20 20	20 70	+4		+5	Pres. glasses	8 mos. after str. w. glasses, not without.	
121	7½		O. D.	S'cond.	45	20 200	20 100	20 200	20 20	+4		+4 cyl. ; ax. 90.	Advt. right internus; result perfect	15 months after eyes still correct.	
122	20	O. D.			55 to 60	20 100	20 20	20 100	20 20	Hyperopic As.		E	Advt. right externus; result perfect		
123	14	O. S.			35 to 45	20 70	20 70	20 20	20 20	+1.25 s. ⊂ ; +0.5 c. ax.90		+1.25 s. ⊂ ; +0.5 c. ax.90	Pres. glasses	Eyes are straight with glasses. See note 2.	
124	40	O. D.		In acc.	45	20 30−	20 20	20 20	20 20	+0.5 c., ax. 90		+0.5	Pres. glasses for near vision		
125	13	O. D.			35	20 200	20 20	20 70	20 20	+1 s. ⊂ ; +3.5 c. ax. 90		+4.5	Pres. glasses		
126	12	O. D.		Upw'd	65	4 200	20 20			E		E	See note 3.	This was a case of congen. strabismus.	
127	13	O. D.			45	10 200	20 50	20 70	20 30	−3		−0.5 s. ⊂ ; −1 c. ax. 65	Pres. glasses	Condition improved by glasses.	
128	12	O. S.		Int'mit	30 to 40	20 40	20 40	20 20	20 20	+4.5 s. ⊂ ; +0.5 c. ax. 45		+5 s. ⊂ ; +0.5 c. ax. 135	Pres. glasses	For 5 years has not squinted w. glasses.	
129	24		Alter'g	Int'mit	Varies	20 100	20 100	20 15	20 15	−2 s. ⊂ ; −0.5c. ax. 180		2 s. ⊂ ; 0.5 c. ax. 180.	No treatment		
130	22	O. D.			Varies	20 20	20 20	20 20	20 20	+1 s. ⊂ ; +0.5 c. ax. 120		+1 s. ⊂ ; +0.5 c. ax. 45.	Pres. glasses		
131	5	Alter'g			50 or more	20 30+	20 30+	20 20	20 20	+2.5		+3	Pres. glasses		
132	12	O. D.			50	20 30−	20 30+	20 20	20 20+	+2.5 s. ⊂ ; +0.75 c. ax. 90		+2 s. ⊂ ; +0.75 c.ax. 115	Advt. right externus; result perfect		
133	19	O. S.			30 to 50	20 20	15 200	20 20	15 200	+2		+4	Advt. left externus; result perfect	[tion.	
134	9	O. S.			55	20 20	20 40			E		E	Advt. left externus; result perfect	Seen 2 years later, eyes in perfect condi-	
135	5	O. D.			35 and more	20 70	20 50	20 30−	20 30	+2 s. ⊂ ; +1.75 c. ax. 110		+2 s. ⊂ ; +1.75 c. ax. 70	Advt. right externus	5 yrs. after no strabismus, has not worn glasses for years.	
136	4	Alter'g		Int'mit	Varies					+4		+4	Pres. glasses		
137	17		Alter'g	Int'mit	20 and more	20 20	20 20	20 15	20 15	+0.5 s. ⊂ ; +0.5 c. ax. 90		+0.5 s. ⊂ ; +0.5 c. ax. 90	Pres. glasses and orthoptics	3 yrs. later complete relief.	
138	15		O. S		40	10 200	10 200	20 20−	20 50+	5		4	Pres. glasses		
139	32		Alter'g		Varies	10 200	10 200	20 30	20 30	6 s. ⊂ ; −0.75 c. ax. 115		−6 s. ⊂ ; −0.75 c. ax. 65	Pres. glasses		
140	10	O. D.		Int'mit	Varies	20 200	20 70	20 70	20 40	+5 s. ⊂ ; +1 c. ax. 90		+6.5 s. ⊂ ; +1 c. ax. 90	Pres. glasses		
141	34	O. S.			Varies	20 30−	5 200	20 20+	5 200	+0.5 s. ⊂ ; +0.5 c. ax. 45		+1.25	Pres. glasses	3 yrs. later eyes straight w. glasses.	
142	19		Alter'g	Int'mit	25 and more	20 20	20 20	20 15	20 15	+0.5		+0.75	Pres. glasses		
143	63		O. S.		35	20 30+	20 30+	20 20+	20 30+	+1		+0.5	Pres. glasses		
144	22		O. D.		40	5 200	20 70−	5 200	20 30	5		5 cyl. ax. 20	Advt. right internus	Result perfect.	
145	17		O. D.	Int'mit	25 and more	20 30	20 30+	20 20	20 15	+0.5 s. ⊂ ; +0.5 c. ax. 90		+0.75 s. ⊂ ; +0.25 c.ax.90	No treatment		
146	24		O. S.		45	20 70	4 200	20 20	4 200	+3.5 s. ⊂ ; +1.5 c.ax.100		+5	Pres. glasses		
147	25		O. D.		40	Percep. light		20 20		E		E	No treatment		
148	28	O. S.			Varies	20 40	10 200	20 20−	20 100	+4 s. ⊂ ; +2 c. ax. 30.		+4 s. ⊂ ; +2 c. ax. 150.	Pres. glasses		
149	9	Alter'g			20 and more	20 50	20 40−	20 20−	20 20−	+1.5		+1.5	Pres. glasses	5 yrs. later eyes straight, does not wear glasses.	
150	13	O. D.			45 to 50	20 20	20 20			E		E	Advt. of both externi; result good		
151	8	O. S.			35	20 20	20 50	20 20	20 30	+2		+3.5	Pres. glasses	5 yrs. later eyes straight, wears glasses.	
152	10		Alter'g		20 and more	20 20	20 20			E		E	No treatment		
153	27	O. S.			30	10 200	10 200	20 50−	20 50	+6		+6	Advt. both externi; result good		

Number.	Age.	Divergent and which eye.	Other forms.	Degree.	Vision at first visit. O. D.	Vision at first visit. O. S.	Corrected vision. O. D.	Corrected vision. O. S.	Refraction. O. D.	Refraction. O. S.	Treatment and Result.	Remarks.
154	50			18 and more	20/30	20/30	20/20	20/20	+0.75 cyl., ax. 75	+0.75 cyl., ax. 135	Pres. glasses	
155	21			50	20/30	20/40	20/20	20/20	E 1.5	E 2.5	No treatment.	
156	33			20	20/30	7/200	20/200	20/200	+0.5 c., ax. 45	+0.5 c., ax. 135	Pres. glasses	
157	32			20	20/30	20/30	20/20	20/15	−0.5 s. ○ ; +0.5 c. ax. 90	−0.5 s. ○ ; +0.5 c. ax. 90	No treatment.	
158	17			12 to 20	20/30	20/30	20/20	20/20	3.	3.	Pres. glasses	
159	30			50	20/30	20/200	20/20	20/20	−0.75 s. ○ ; +0.25 c. ax. 90	−0.75 s. ○ ; +0.25 c. ax. 90	Advt. left internus; result perfect.	
160	21			35	20/30	7/200	3/200	3/200	1.	1.	Advt. right externus; result perfect.	
161	6	O. S.		30 and more	20/200	20/200	20/30	20/30	0.5 c., ax. 90	0.5 c., ax. 90	Advt. left internus; result good.	2 years later eyes are correct.
162	18	Alter. R.		20	20/70	20/70	20/30	20/30	0.5 c., ax. 90	0.5 c., ax. 90	Pres. glasses and prism exercises	6 months later most satisfactory.
163	41			30	20/30	20/30	20/20	20/20	4.	4.	Advt. left internus; result perfect.	Result perfect.
164	39	O. S.		18 to 30	20/30	20/40	20/20	20/20	E 2.5 s. ○ ; +1 c. ax. 90	E 2.5 s. ○ ; +0.5 c. ax. 90	Pres. glasses and prism exercises	5 yrs. later mus. anomaly disappeared.
165	52	O. D.		45	20/30	20/30	20/20	20/20	Opth. shows eyes to be emmetropic	See note 4.		
166	16			Mixed	20/30	20/30	20/20	20/20	1.25 s. ○ ; +0.5 c. ax. 180	Atropin	Pres. glasses	5 yrs. later eyes straight with glasses.
167	11	O. D.		30 to 45	20/30	20/30	20/20	20/20	3.5 s. ○ ; +1 c. ax. 45.	2.5 s. ○ ; +0.75 c. ax. 135	Advt. left externus; result perfect.	3 mos. later eyes straight w. glasses.
168	3	O. D.		50	20/30	20/30	20/20	20/20	1.	1.25	No treatment.	See note 5.
169	10	O. S.		35	20/70	20/70	20/30	20/30	2.5 s.	2.5 s.	Pres. glasses.	6 years after still perfect.
170	40			60	20/30	1/200	20/30	20/40	1.	1.25	No treatment.	
171	21		Also up	35	20/30	20/70	20/30	20/40	2.5 s.	2.5 s. ○ ; +0.75 c. ax. 135	Pres. glasses.	
172	36		Second.	12 to 20	20/30	20/70	20/30	20/30	3.5 s. ○ ; +1 c. ax. 45.	2.5 s. ○ ; +0.75 c. ax. 135	Advt. left externus; result perfect.	
173	32			14	20/30	20/100	20/30	1/200	1.25 s. ○ ; +0.5 c. ax. 180	1.25	No treatment.	
174	20			15 and more	20/30	20/100	20/30	20/40	2.5 s. ○ ; +1 c. ax. 90	2.5 s. ○ ; +1 c. ax. 90	Pres. glasses.	
175	18			Varies.	20/30	20/30	20/30	20/40	0.5 c., ax. 90.	0.75	Pres. glasses	
176	41			30	20/30	20/30	20/30	20/30	3.	3.5 c. ax. 180	Advt. both interni; result perfect.	
177	25			45	20/30	20/200	20/30	20/30	16.	0.5 c., ax. 90.	Pres. glasses	Had previously had tenot. both externi.
178	27			Worse for nr.	20/70	20/200	20/30	20/50	1.	1.	Advt. right externus; result perfect.	
179	12		Int'mit	20 and more	20/70	20/70	20/40	20/40	1 c., ax. 90	0.5 s. ○ ; +1 c. ax. 90	Pres. glasses	4 yrs after eyes are correct.
180	15			40	20/70	20/70	20/30	20/30	3.5 s. ○ ; +2.5 c. ax. 90	4 s. ○ ; +2.5 c. ax. 80	Pres. glasses	
181	35	O.		35	20/70	20/200	20/30	20/70	6.	4 cyl., ax. 90.	Pres. glasses	After 1 year less divergence.
182	21			40	20/30	20/30	20/30	20/30	2.75 s. ○ ; +1 c. ax. 45	E 2.75 s. ○ ; +1 c. ax. 135	No treatment	
183	21	O. S.	Int'mit	Varies.	20/30	20/30	20/30	20/30	0.25 c., ax. 90	0.25 c., ax. 75	Pres. glasses and orthoptics.	Traumatic cataract in right eye.
184	30			50	20/30	20/70	20/30	20/50	1.	1.	Advt. both externi; result perfect.	
185	35	O. S.		45	20/70	20/70	20/30	20/30	E 1.	E 1.	Advt. right externus; result perfect.	After 6 months there is orthophoria.
186	5			40	20/70	20/70	20/30	20/30	6.	E 3.	Advt. both interni; result perfect.	3 years after eyes are still correct.
187	46	O. D.		45	20/70	20/100	20/50	20/50	3. 75	2. 75	Pres. glasses	
188	40	O. D.		35	20/100	20/100	20/30	20/30	O 5 s. ○ ; +2 c. ax. 90	E 3.5 s. ○ ; +1.5 c. ax. 90	Advt. right externus; result perfect.	6 yrs. after eyes correct with glasses.
189	14	O. D.		40	20/100	20/200	20/30	20/100	1 cyl., ax. 75	1 c. ax. 90	No treatment	
190	26	O. D.		35	20/100	20/200	20/30	20/30	3 cyl., ax. 135	1 cyl., ax. 75	Advt. right externus.	Traumatic cataract in right eye.
191	28	O. D.		55	20/100	20/200	20/30	20/30	0.75 c., ax. 90	0.75 c., ax. 90	Advt. both externi; result perfect.	
192	40	O. D.		35	20/100	18/200	20/30	20/30	4.5 s. ○ ; +0.5 c. ax. 90	1.5 s. ○ ; +2.5 c. ax. 45	Pres. glasses	
193	35	O. D.	Down.	Varies.	20/200	20/200	20/30	20/30	1.25 s. ○ ; +0.5 c. ax. 180	0.75 c., ax. 90	Pres. glasses	
194	20	O. S.		45	20/200	20/200	20/30	20/30	4.	1.5 s. ○ ; +0.5 c. ax. 180	Pres. glasses	Eyes correct, wearing glasses.
195	8			30	20/200	20/200	20/30	20/40	6.	3.	Pres. glasses	
196	6	O. D.		45	20/200	20/200	20/30	20/30	2.5 s. ○ ; +0.5 c. ax. 90	1.5 s. ○ ; +0.5 c. ax. 180	Pres. glasses	Eyes straight, wearing glasses.
197	52	O. D.		35	20/200	8/200	20/30	20/200	1.25 s. ○ ; +0.5 c. ax. 180	1.5 s. ○ ; +0.5 c. ax. 180	Pres. glasses	
198	12	O. D.		45	20/200	20/200	20/30	20/30	6.	3.	Pres. glasses	
199	18			35 to 40	20/200	20/200	20/30	20/30	6.	6.	Pres. glasses	Eyes straight, wearing glasses.
200	49			Varies.	20/200	20/200	20/30	20/30	2 s. ○ ; +0.5 c. ax. 90	0.5 s. ○ ; +0.5 c. ax. 90	Pres. glasses	
201	32		Int'mit	Varies.	20/200	20/200	20/30	20/30	E 2 s. ○ ; +3 c. ax. 90	E 0.75	Advt. left externus; result perfect.	
202	11		Int'mit	Varies.	20/200	20/200	20/30	20/30	6 s. ○ ; +1.25 c. ax. 180	6 s. ○ ; +1.25 c. ax. 180	Pres. glasses	
203	10		Int'mit	Varies.	20/200	20/100	20/30	20/30	5.5 s. ○ ; +0.75 c. ax. 90	5.5 s. ○ ; +0.75 c. ax. 90	Pres. glasses	
204	26		Int'mit	Varies.	20/200	20/200	20/30	20/30	1.5 s. ○ ; +0.5 c. ax. 180	1.5 s. ○ ; +0.5 c. ax. 180	Pres. glasses	
205	24	O. S.	Int'mit	Varies.	20/200	20/200	20/30	20/30	3.	3.	Pres. glasses	
206	13			50	20/200	20/200	20/30	20/40	2.5 cyl., ax. 60.	2 cyl., ax. 120	Pres. glasses	Squint more appar. in accommodation.
207	14			40	20/200	20/200	20/30	20/30	1 s. ○ ; +3 c. ax. 90	1 s. ○ ; +4 c. ax. 90	Pres. glasses	Squint very marked in accommodation.
208	33			Varies.	20/200	20/200	20/30	20/50	2 s. ○ ; +0.75 c. ax. 90	0.5 c., ax. 90.	No treatment.	
209	35	O. D.		45	20/200	20/200	20/30	20/30	E...	E 3.	Advt. both interni; result perfect.	There are Fuch's colobomata of nerve-heads.
210	33	Alter. R.		20 and more.	20/200	20/200	20/30	20/100	3.	3.	Pres. glasses	
211	20	O. S.		35	20/200	20/200	20/30	20/30	2 s. ○ ; +2.5 c. ax. 180	2 s. ○ ; +2.5 c. ax. 180	Advt. left externus; result perfect.	Eyes are straight, wearing glasses.
212	14			35	20/70	20/200	20/30	20/200	13.	2	Pres. glasses and orthoptics.	
213	67			45	20/70+	20/200	20/30	20/30	1.5	1 s. ○ ; +1 c. ax. 90	Pres. glasses	Vastly improved by glasses as to squint.
214	66				5/200	2/200	20/50	20/50	12	1.5	Pres. glasses	
										10 s. ○ ; +3 c. ax. 45	No treatment	
											Pres. glasses; squint disappeared.	See note 6.

[1] I removed congenital capsular cataract from both eyes in this case when the child was less than 2 years of age.

[2] There is paresis of the accommodations, requiring +3 for near vision. These glasses prevent squint.

[3] Advt. right externus, curbed tenotomy right internus; advt. (later) of right inferior rectus; result perfect

[4] Advt. right externus; tenotomy all outer portion of right superior rectus.

[5] After using drops one month eyes became straight and have remained so for five years.

[6] Extracted cataract from right eye; needled left papillary membrane.

In conclusion, I would add that the more I study the anomalies of the ocular muscles, the more I see and the more I do, the stronger becomes my conviction that muscular advancement is the only operation —not the only *treatment*—but the only operation, not only for all forms of strabismus, but also for the strabic tendencies. De Wecker of Paris, in a recent magnificent paper on the results of strabismus operations (Annals d'Oculistique, January, 1898), recommends advancement whenever binocular single vision is the end in view, *and tenotomy, or tenotomy and advancement* when the ultimate aim is a cosmetic result. A stronger endorsement than this of advancement as the best procedure in *all* cases could hardly be conceived.

ADDITIONAL NOTES ON EMPLOYMENT OF ABSORBABLE SUTURES IN THE OPERATION OF LOOPING THE TENDONS OF OCULAR MUSCLES.

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In my original paper on this subject before this ASSOCIATION in 1897, I briefly referred to a method of employing kangaroo tendon in the operation of shortening the ocular muscles, but additional experience has taught me the importance of certain modifications, which I will attempt to present for your consideration today. And I shall feel more than amply rewarded for the labor of this pleasant task, if the members present will kindly contribute their suggestions from their wealth of vast and varied experience.

In the first place, I should like to say that the kind of suture material and also the method employed should vary according to the amount of correction desired. Speaking in general terms, I would consider that for the different forms of heterophoria of moderate degree, the catgut suture will supply the requirements and should be preferred because of the fact that it is practically absorbed within three or four days and will involve the minimum amount of reaction. But when this material is used the heterophoria should be over-corrected in order to allow for relaxation of the sutures and the stretching of the newly formed adhesions. In cases of extreme heterophoria and in heterotropia, kangaroo tendon offers the most reliable results, because of the fact that it does not become absorbed for two or three weeks and does not weaken rapidly from contact with the tissues, and hence will maintain the structures in the desired apposition until firmer adhesions have formed. And when this kind of suture material is used, we should secure at the time an amount of over-correction proportionate to the tension placed upon the sutures.

With regard to the method of operating, I would say for small degrees of heterophoria employ this method: with broad fixation forceps provided with teeth sufficiently long and sharp to engage all the structures down to the sclera, grasp the conjunctiva, capsule of Tenon and ocular tendon in such a way as to produce a vertical loop of the ocular tendon. Then fix this loop by a single suture passing through it horizontally. If it is desired that the thread should sink beneath the conjunctiva, a slight incision through this membrane will allow this suture to bury itself in the tissues within its grasp while the conjunctiva closes above it.

For high degrees of heterophoria and moderate degrees of heterotropia, I would advise the following: Make an incision along the border of the tendon penetrating the capsule of Tenon. Then with strabismus hooks lift the tendon gently from the subjacent sclera. Then take a thread armed at each end with a sharp, delicate needle, and introduce one needle beneath the tendon close to its scleral attachment, while the other needle is introduced beneath the tendon as far from its scleral attachment as possible. Then carry each needle straight through the tendon, avoiding the conjunctiva, which is simply held aside with fixation forceps. Then tie the free ends of the thread, thus fixing the loop of the tendon; then bring together the conjunctiva and leave the loop to form adhesions and atrophy.

Where the degree of deviation is very considerable it is well to precede the advancement of the weaker muscle by a tenotomy of the stronger one; and then the advancement can be made in accordance with the methods already described, or we may employ another plan, which has the advantages of great leverage upon the eyeball and at the same time less puckering of the tissues. The procedure is as follows: Along the border of the rectus make an incision through all the structures down to the sclera, then with strabismus hooks lift up the tendon gently from the adjacent sclera. Introduce the two armed extremities of the thread beneath the muscle at points as remote as possible from the insertion of the tendon, one needle entering the muscle near its lower border and the other needle entering the muscle near its upper border. These needles are carried from within outward through all the tissues till the conjunctiva is reached and then the needles are carried beneath the conjunctiva, one passing along the superior corneo-conjunctival junction and the other passing along the inferior corneo-conjunctival junction. When the threads have reached the opposite side of the cornea from the tendon to be advanced the threads are made to approach each other, while the necessary traction is exerted by the tying of the threads, thus producing a decided rotation of the eyeball toward the tendon to be shortened. The conjunctival wound can now be closed and the sutures left for absorption. In all these operations for muscle shortening the great advantages over the various tenotomies, graduated and complete, are the accuracy with which the adjustment can be made, the freedom from danger of over-correction and the fact that the process is one for making shorter the weaker muscle and not making weaker the shorter muscle; in other words, the advantages are accuracy, safety and strength.

DISCUSSION ON PAPERS OF DRS. BEARD AND M'REYNOLDS.

Dr. H. V. WÜRDEMAN of Milwaukee—Since Dr. Beard first demonstrated this operation to me, probably about six years ago, I have used it somewhat extensively, at least more than any other form of advancement operation for heterophoria and for cases of strabismus in which a decided amount of reposition of the recti muscles is needed. I have used it most satisfactorily in cases of strabismus of more than 15 degrees. For cases less than this, or for heterophoria I prefer one of the minor forms of advancement, such as described by Stevens and others. I do not as a rule cut off the tendon stump as described by Beard, as I believe the laying of one portion o

the tendon over the other gives us a more secure hold, as in the healing process we get agglutination, and the little thickening is absorbed sooner or later, so it is of no particular consequence. Immediately after the operation is finished we frequently find that the cornea is practically covered by a fold of conjunctiva, but that is an advantage, for it lies under the stitch and is a protection to the cornea. After seven or eight days the reaction entirely passes away, sometimes sooner. It is advisable to use braided silk for the sutures. I object to the use of absorbable sutures in any form of advancement on account of the tendency for relaxation. We frequently find by this method, as well as by others, an over-effect of apparently 5, 10 or 15 degrees, but the next day, if the suture has slipped at all, we may have an under-effect, so I think it more desirable to have a stitch that will hold. I believe it is advisable to leave a loop in the stitch during the operation in order to pass the suture through, and find it more convenient than having to pick up the loop afterward, and I wish to lay stress upon the necessity for the needles being very sharp. We must get a good hold on the sclera.

Dr. MELVILLE BLACK—I would like to demonstrate on the blackboard a little operation of my own that resembles this one of Dr. Beard's very closely. A curved needle is threaded with No. 5 iron-dyed silk and the two ends tied into a hard knot. The needle is passed through the conjunctiva into the sclera for a good bite just below the cornea. Before pulling the thread through up to the knot, the needle is passed back between the two strands of thread close to the knot and then pulled home. You will observe that I now have a point of scleral fixation close to the cornea, and at the free end of the thread is the needle. A similar procedure is now gone through with above the cornea. You see that I now have two sutures similarly tied into the sclera at corresponding points above and below the cornea. With a strong pair of mouse-toothed forceps the belly of the muscle to be advanced is now raised, and with a pair of scissors the conjunctiva and underlying tissue are incised along the border of the muscle above and below. A tenotomy hook is passed underneath the muscle and the forceps withdrawn. One of the needles is passed through the muscle, or tendon, according to whether it is desired to do a strict advancement or a shortening. I forgot to say that the needle is passed from below upward. The thread is pulled about halfway home. The other needle is now passed in a similar manner. If it is desirable to do an advancement, the tendon is severed from its attachment. If it is deemed best to shorten as well as advance, the needles have been passed through the muscle at an appropriate distance from the tendinous insertion, and the muscle should be severed about two millimeters or more from the needles, or rather the threads. The tenotomy hook is now removed and the attached end of the muscle is grasped with forceps and severed from its attachment to the globe. The conjunctiva should be removed at the point where it is desirable to pull up the muscle for re-attachment. Now comes the advantage to be gained by having performed the operation as described. An assistant is not needed, because the operator can grasp with one hand the two threads, and with his other hand the globe is rotated in the desired direction with a pair of forceps. When the eye is drawn into the desired position the two threads are tied over the muscle, and the operation is completed. You will observe that there can be no torsion of the globe caused by one suture being shorter than the other, because there is enough play of the sutures in the muscle to overcome any such inequality. The sutures are allowed to remain in position for five days, when, as you will observe, they are very easily removed. This operation has proved universally satisfactory, both for advancement in heterophoria and for shortening and advancement in extreme cases of true squint. I always perform the operation under cocain anesthesia, except in very young children, and find that it takes but little longer than simple tenotomy. A wet bichlorid dressing is applied and the eye bandaged for twenty-four hours. The patient experiences but little pain, and there is scarcely any reaction on the following day.

Dr. G. C. SAVAGE—"Man wants but little here below, nor wants that little long," but we all want credit for any operation we may have devised. Dr. McReynolds will acknowledge that the operation he described was devised by me. I have seen Dr. Beard perform his operation and I want to say that I believe the operation is rather too severe for the effect to be accomplished. I agree with him on this point, that in straightening the eyes it is better to do a partial tenotomy of the offending muscle and an advancement of the other, than to cut the muscle completely loose from the eyeball. A partial tenotomy ought always to be done in squint, and the rest accomplished by advancement, and having done the partial tenotomy I think the Stevens advancement is the best operation to conclude with. The reaction is slight and there is no torsion. Of the two operations described here today I want to say that I believe Dr. Black's is the simpler, secures the same effect and does not require a general anesthetic. In any operation the less traumatism we produce in accomplishing our purpose, the less danger there is of infection. Muscle shortening is applicable only in the heterophoria. In heterotropia its effect is too little.

Dr. BEARD—I used to tie the sutures in a bow knot at first, and it may be a good idea still, but I found it difficult to get the patients to come back and have the knot adjusted. I came to the conclusion that it was not practicable and lately have not used it. This is only one method of treating strabismus, and I have only used it in cases that would not yield to any other treatment. As regards the degree of turning that one can get, that depends merely on where you place the suture, for you can get up to thirty or forty degrees with ease.

Dr. KINNEY—Do you have any difficulty with torsion and do you both shorten and advance?

Dr. BEARD—One idea of this operation is to prevent torsion. If the thread is properly inserted and there is no snarl, the muscle comes forward directly in line with its axis, and the tension on the thread is equal at every point. In reply to Dr. Savage, I would say that I never use a general anesthetic for operation, except in cases of little children or excessively timid adults.

Dr. MCREYNOLDS—One of the most important features, to my mind, was the employment of an absorbable suture instead of silk, because of the difficulty I found in getting the silk out of the loop. This was almost as much of an operation as the original one. I consider the kangaroo tendon the best because it is absorbed the more slowly. In my experience I can secure as much correction as I desire, if I can get a hold as far back as I please, and if I want the maximum of correction I pass the suture clear around the cornea to the opposite side.

A STORY OF CHICKAMAUGA.

[PART II.]

BY R. STANSBURY SUTTON, M.D.

Major and Chief Surgeon U. S. V., Commanding Second Division, First Army Corps Hospital at Chickamauga.

There was a great deal of sickness at Chickamauga Park. You would not expect to put 60,000 men in a camp seven miles square and keep them there all summer without sickness. Furthermore, a large number, the great majority, were from northern climates and not only had they that to contend with, but their entire mode of living had been changed, and they were necessarily subjected to daily drill of about five hours, required to educate them to be soldiers. In addition to this they had their camp duties to perform

and their own necessities to look after, and it was but natural that some of them should become ill. Volunteer soldiers, without experience in camp life, great numbers of whom at home were unaccustomed to hard work and plain food, would naturally suffer some inconvenience. In every army there is an element which, if not restrained, will abuse themselves by drunkenness, vice and immorality, and this army has been no exception to other armies. There was considerable suffering by reason of these things. In this respect, however, at Knoxville, there has been a marked improvement. This element is being held down by a strong provost guard. Before our army entered Chickamauga Park—and 75,000 troops have been there—typhoid fever was prevailing, as stated, among the farmers living on the edge of this park; they supplied the camp, to the extent of their saleable articles, with milk and general farm products, and it is entirely probable that they introduced the infection. In time the camp became reinfected through the sinks and careless use of the grounds by soldiers. When the rains set in about July 17, the surface infection was washed into the creeks and streams, the soldiers resorted to the swollen streams for bathing and washing purposes, and this was doubtless another cause of the spreading of the disease. The flies were in the camps by myriads, and they carried on their wings, legs and bodies the typhoid germs from the sinks and elsewhere, over the camp, infecting the food and drink to a greater or less extent. Another source of infection was doubtless cases of typhoid imported by regiments coming from other places, but the disease did not assume alarming proportions until about August 10, after the rains had ceased. The water supply has been, by the public press, credited with a great deal of the disease in Chickamauga Park. This supply was from four sources. The springs outside of the park, from which the water was hauled by mule teams, were, I believe, sources of pure water, and from one of these I supplied the hospital, in which our mortality was 14 out of 984 patients. The second supply was by pipe line from Crawfish spring. In regard to the purity of this water there has been a dispute. The influent pipe was, until August 6, at least a mile below the spring, but after that date was carried up the river to a point near the spring, but after digesting all the causes of typhoid in the camp, I am disposed to give credence to those who have pronounced this water to have been pure. The third source was from drilled wells. Into them was dropped a tube with a pump attached, and the surface water reached and polluted that water, and it was impure. For a time some troops got water from these wells, but they were shut off by order of S. H. Hysell, Division Surgeon-Major. The form of typhoid fever prevailing was not always of a severe type. Hundreds of these cases were called cases of malarial poisoning. They went about in camp, unfitted for duty, growing thin and pale and eventually went to bed, or beginning to convalesce, got well, uncertain as to whether they had malarial fever or typhoid. Outside of typhoid fever and the results of indiscretion the troops were comparatively healthy, and cases of ordinary sickness did not exceed a reasonable expectancy in camp life. The medical staff of the army at Chickamauga were men of more than average ability, and I have never before seen a more enthusiastic devotion to duty than was evinced by them. As commanding officer of the second division hospital, I had seven commissioned officers. Six of these were medical directors. Major H. B. Bagley of Wheeling, W. Va., had charge of the surgical department, with Captain Dutton of Minneapolis as his colleague. Major P. J. Myers of Fostoria, O., had charge of one half of the medical wards, with Lieutenant Ltttle, of Macon, Ga., for his colleague. Major Charlton of Indianapolis, with Lieutenant Nesbitt of Fairmont, W. Va., had charge of the other half. The devotion of these men to their respective duties is best told in the statement that of 984 patients on the hospital register, but fourteen died. The hospital averaged about two hundred and twenty-five patients and occupied within its site for all tentage about three acres of ground. The hospital corps after August 20, consisted of about one hundred and five men. Prior to this date it was as low as thirty-nine members. From this corps, nurses, cooks, clerks, guards, men for general utility work, keeping grounds clean, hauling water with mule teams, etc., were furnished. Lieutenant Cary, seventh officer, from Duluth, Minn., had charge of the commissary department, and proved to be an able officer. The rations furnished by the government were of good quality and abundant. In addition a liberal supply of fresh meats was furnished daily. We had three kitchens running constantly, with men cooks, as there was not a woman helper on the plant. The Red Cross Society, the National Relief Society, the Army and Navy League of Cincinnati and also the auxiliary Red Cross of Pittsburg, funished me with large quantities of supplies, well adapted to the use of the sick. The latter were well supplied with pajamas, night shirts, slippers, towels, soap, jellies and jams. There are many things in the way of new drugs which the government does not furnish, and the division hospitals and general hospitals receive almost the entire attention of the societies mentioned. The regimental hospitals were left almost entirely without any of these things for their sick, whom they were expected to send into the division hospital promptly, but the latter was often so full that they could not receive them as rapidly as was expected, and consequently for this and other reasons there were at all times sick in the regimental hospitals. The Pittsburg Red Cross sent me $500 in cash, which I distributed largely among the chaplains of the various regiments, for the purchase of milk, butter, poultry and unfurnished drugs for the use of the sick detained in the regimental hospitals. When we take into consideration the fact that the government, in a remarkably short time, aggregated an enormous army of inexperienced and undisciplined soldiers and undertook its maintenance and its detailed care, any unprejudiced observer, with any prior army experience, must arrive at the conclusion that the government has done well. There were times when the supplies of lumber for tent floors and cots were difficult to procure quickly, and unless an emergency had existed requiring their immediate use the delay would not have been serious. Moreover, it is possible that some delay may have occurred in the delivery of these things from other causes than a scarcity of the articles. When you compare the condition of the soldiers in Chickamauga Park in 1898 and in 1863 and 1864, you are forced to the conclusion that the soldiers of 1898 had the best of it. Before I went into the service I wrote to Senator Quay saying that the troops ought to be located and prepared for service in northern camps, and I have no reason to change that opinion. It has been stated

that our Northern troops would naturally suffer more in a southern climate in camp life than Southern troops would, but the First Georgia volunteer infantry was a part of the second division and I received their sick at the division hospital. They contributed a larger portion to the sick than any other regiment in the division. The fact that they were acclimated was not sufficient to enable them to stand up to camp duties in their own State any better, nor as well, as their more sturdy brethren from the Northern States, and I believe now that Southern troops should be drilled in Northern camps, in a summer season pending a campaign. These observations apply only to the portion of the army at Chickamauga, and are not presented as the views of other officers, who may have looked at matters from another standpoint. There has been an enormous amount of exaggeration in regard to the condition of affairs. Of course there have been instances of seemingly unnecessary suffering, but I know of no instance which was followed by death or other serious consequences, and in an army without battle-wounds it is difficult to conceive how the hard conditions of war could prevail to any extent. There were times when sick men were lying on the ground, which was dry and carefully cleaned, and they were under cover. This was only temporary; whereas in the Civil War it was a constant occurrence. This time the rations were abundant, the delicacies more than enough, tents were always at hand. On the night of September 8, a sudden cold wave swept over the camp at Knoxville. The patients in the division hospital did not all have blankets enough, and the army supplies were not at hand, as the emergency was not expected. At 9 P.M., two or three hours after the wave had struck the army, I had a wholesale merchant hunted up in Knoxville and with the money furnished by the Pittsburg Red Cross, I purchased 100 double blankets and sent them up to Major Bagley, then in charge, and some patients were made more comfortable. While it would have been well to have had an extra supply I can scarcely conceive of any negligence on the part of the government to meet an almost unprecedented cold snap at this season of the year in that climate.

Where large bodies of troops are to be kept in one camp for a period beyond fifteen days, the government should provide crematories for the burning of all kitchen garbage and hospital refuse gathered daily. The sinks for reception of stools should be deep, and so inclosed that the pit is perfectly dark. A building of boards should be erected over the sink, proper seats with lids should be within it, and the entire building should be coated with several layers of a solution of lime, carbolic acid and formalin, and several gallons of the latter, in 1 per cent., solution, should be thrown into the sink daily. A solution of formalin is superior for the disinfection of typhoid stools, and such stools should be disinfected in a sink designated to receive infected stools only.

The lessons of the war are many, and are not yet all revealed. The country at large will profit by it, while individuals in many instances will reap sorrow and disappointment. I would again suggest, as I have already done, that inoculation for typhoid fever be tried on all troops going to Cuba, excepting in cases where the soldier has had the disease within a few years. Three soldiers, companions, left Chickamauga for Porto Rico. One, convalescent from typhoid, bemoans his hard luck, two, perfectly well, were jubilant. On the voyage out the invalid recovered, grew strong and returned well. The other two developed typhoid fever and died in Porto Rico. Here is, in this illustration, the sequel of the whole question of immunity, its importance, and its possibility. Surely a serum can be prepared for the attempt.

COLPOPERINEORRHAPHY AND THE STRUCTURES INVOLVED.

DEDICATED TO DR. THOMAS ADDIS EMMET AND MR. LAWSON TAIT IN RECOGNITION OF THEIR LABORS IN THE SURGERY OF THE PERINEUM.

BY BYRON ROBINSON, B.S., M.D.
CHICAGO, ILL.

Continued from page 788.

GENERAL CONCLUSIONS.

1. To cure sacropubic hernia (uterine prolapse), perform amputation of the (sharp) cervix; anterior colporrhaphy; Tait's flap perineorrhaphy.

2. The amputation of the cervix is for the purpose of removing the sharp cervical point; directing the cervix backward; restoring the uterus to normal position.

3. The anterior colporrhaphy is for the purpose of narrowing the vagina; elevating the bladder, directing the cervix backward and the fundus forward.

4. The Tait flap perineorrhaphy is for the purpose of restoring the perineum; restoring the obliquity of the genital canal; restoring such a central floor as will efficiently support the rectum, bladder, and genitals.

5. If the cervix be not pointed and retroversion does not exist amputation of the cervix may be omitted in the above procedure.

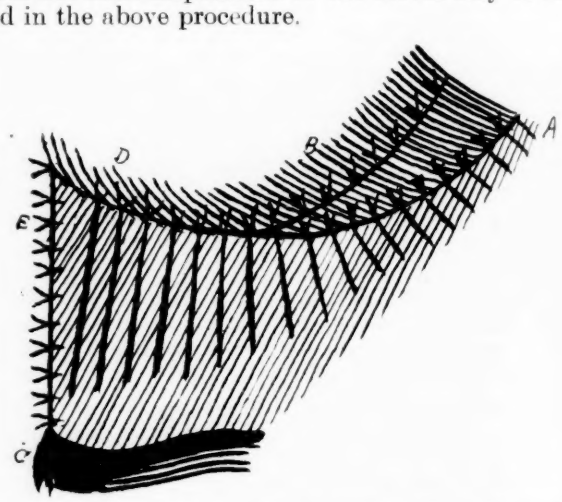


Fig. 30.—Profile view of A. Martin's colpoperineorrhaphy posterior. A, B, elytrorrhaphy; D, E, C, perineauxesis.

6. If the uterus and bladder be in normal position and the vagina not prolapsed, anterior colporrhaphy may be omitted.

7. The permanent success of Tait's perineal flap operation consists in extensive flaps (by means of front and back cuts) and the drawing into the median line of large masses of lateral tissue for a pelvic floor. These lateral masses are drawn in and secured for weeks by deep sutures of silkworm gut. These deep sutures, six to eight in number, act like splints for four to eight weeks, and though part of the wound suppurates, the sutures maintain it in coaptation while it granulates and heals.

8. Our operations have proved definitely that the rectal sphincters may be practically restored to normal, even after long periods of rupture. One case of thirty-four years' standing, with two previous unsuccessful denuding perineorrhaphies and a complete laceration of three inches up the rectum was restored to perfect function.

9. The three surgical procedures described will obviate hysterectomy in many cases.

10. The flattening out of the operation, or the yielding of the union, or the stretching of the parts allowing prolapse, will depend especially on the flaps and the amount of tissue permanently drawn into the middle line.

12. We especially insist that better results are obtained by allowing the silkworm gut sutures to remain in position for from four to six weeks. Should any suppurate they may be removed at any time. Wounds do not heal very firmly under three weeks.

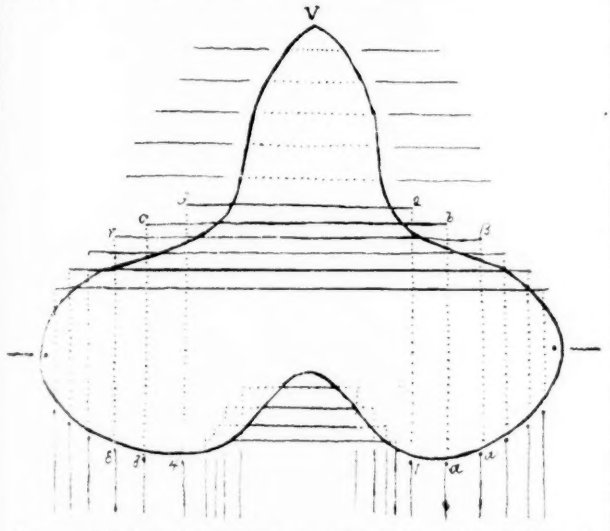


Fig. 31.—Hildebrandt's method of denudation and suturing. The dotted lines show the sutures under the tissues. The denuded area is that of a trefoil. Hepner's method of suture is that of a figure 8. Cleveland's method is simply a peculiar method of suturing.

13. We feel decided in stating from our own experience that the flap operation should not be disturbed by dressings. The patient should be kept quiet for three days, and then a vaginal douche may be given daily. After the first half day the wound is hermetically sealed by its own oozing. The limbs should be tied together at the knees. The bladder will generally require the use of the catheter for two to four days. Morphin injections of 1/16 of a grain may be given to quiet the pain and induce rest.

14. The dissection of the rectum from the vagina for one to three inches, was added from my own experience, as I never saw Mr. Tait do this. This additional procedure lengthens the operation to fifteen to thirty minutes; Mr. Tait performs his operation in five to ten minutes.

15. The result of the foregoing surgical procedure has been gratifyingly successful.

16. The flap operation fits any and every case, for it resplits the old cicatrix and restores and adds what is required.

17. In no single case, in over 150 which I have observed, was the flap operation not applicable.

18. The flap method makes little scar tissue, as the operative procedure is performed in connective tissue while cicatrices form in skin and mucosa. In the flap colpoperineorrhaphy the posterior vaginal wall is made to sustain the anterior.

19. In the flap operation the vaginal walls are made to give their full support to the uterus—the posterior wall sustains the anterior vaginal wall and bladder—and also to support and direct backward the rectal wall.

The flap perineorrhaphy has been chiefly revised and introduced to the profession by Mr. Lawson Tait of Birmingham, England. It is true the flap perineal operation was performed in various ways by others, as Duncan, Colles, Jenks, Marcy and Langenbeck. But Mr. Tait gave it a new impetus, and also performed it with new phases. He performed it with elbow scissors and introduced sutures which neither penetrated skin nor mucous membrane. As a pupil of Mr. Tait, for six months, I had ample opportunity to observe his methods of operation. The principle of operation consists in resplitting the old perineal cicatrix without loss of tissue, with fixed coaptation of the flaps. After observing Mr. Tait's methods I

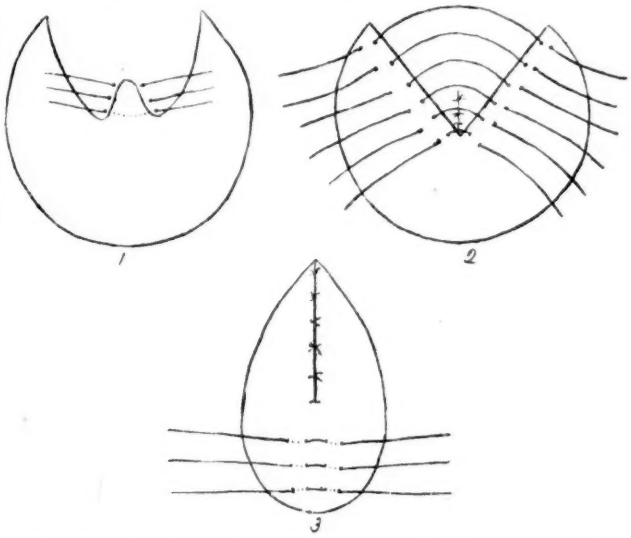


Fig. 32.—(After Pozzi.) Lautenbach's method in incomplete rupture of the perineum. 1, suture of the superior angle; 2, submucous suture of the vaginal wall; 3, buried sutures deep in the wound.

naturally practised the operation as performed by him and his assistants. About a year later I began to modify the operation by dissecting the rectum and vagina from each other for a variable but long distance (1 to 2½ inches) above the vulva or anus. This modification enabled me to apply it to almost all forms of prolapse, relaxed vaginal wall or perineal laceration; in short, in all conditions requiring perineorrhaphy and colporrhaphy posterior. The objections raised against the flap method we found, after over six years' trial, were not well founded. One objection is that Tait's flap perineorrhaphy is a "skin operation." If performed superficially it may be subject to the above criticism. However, such criticism can only be applied to imperfect execution. The operator must carefully guard against closing the vulva too far. One can easily make an excessive perineum by the flap method. This objection is, as a matter of fact, worthless. Another objection is that the flap method in no way narrows the vagina. This objection will not hold, as the vagina can be narrowed so as to embrace tightly a single index finger. In fact, we can dissect the rectum and vagina from each other for three inches, up to the peritoneum, or as high as desired, and narrow the lower third of the vagina as much as the operator sees fit. The upper two-thirds of the vagina does not require narrowing. Another

objection is that it does not approximate the fibers of the levator ani. It is the operation par excellence to unite the deranged or torn levator ani fibers, because the dissection is carried beyond the levator ani fascia superior and inferior through the levator ani muscle. In fact, it enables the operator to secure both the levator ani fascia superior and inferior, which embraces the levator ani muscle. One must secure the levator ani fascia in order to secure the levator ani muscle, which is guarded and embraced by a definite fascial sheath. The flap operation reunites the posterior vaginal fascial septum without denudation, as Emmet's operation unites it with denudation. Both Emmet's and Tait's operations are based anatomic-

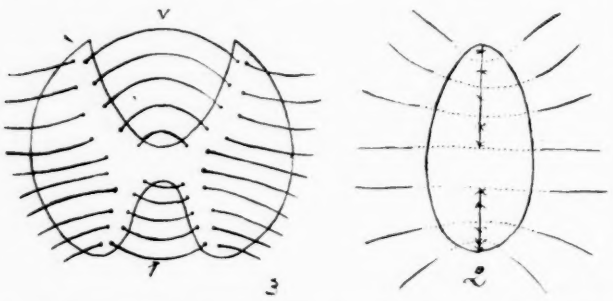
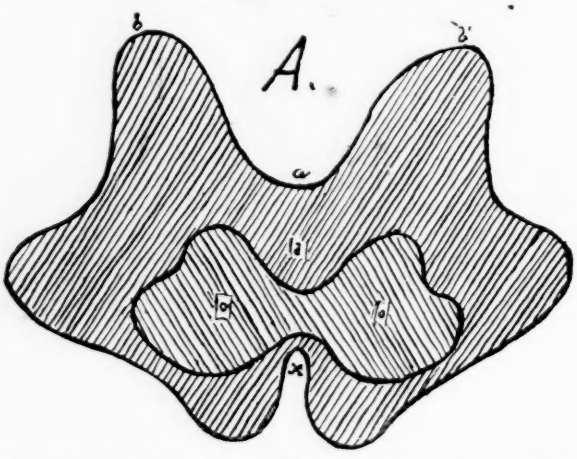


Fig. 33.—Lauenstein's suture in complete laceration. 1, introduction of sutures which coapt the vagina and rectal mucosa; 2, introduction of the perineal sutures after the vaginal and rectal have been fastened.

ally on the same principle—one denudes however, and the other does not, but employs a flap to cover the wound. My practice is to dissect the rectum and vagina in the lateral sulci. In the American Textbook of Gynecology the writer on "Flap-splitting Perineorrhaphy" makes the following absurd statements: "Its field of usefulness is very limited indeed. Practically it is applicable to those cases in which only the superficial and most exterior fibers of the



perineum are torn." The above views can certainly be based only on imperfect knowledge, execution, or observation of the operation. We can affirm that it is one of the most certain and effective of all operations on the perineum. The flap method of colpoperineorrhaphy is the one above all others that enables an operator to reunite the levator ani fascia superior and inferior with the enclosed levator ani muscle without blind searching, to abolish a rectocele, and to repair prolapse of the uterus. The same writer cited above makes a further statement as ridiculous as the first, that, "In no way possible can this operation (flap-splitting) narrow the vagina, abolish a rectocele, or bring together the separated fibers of the pelvic

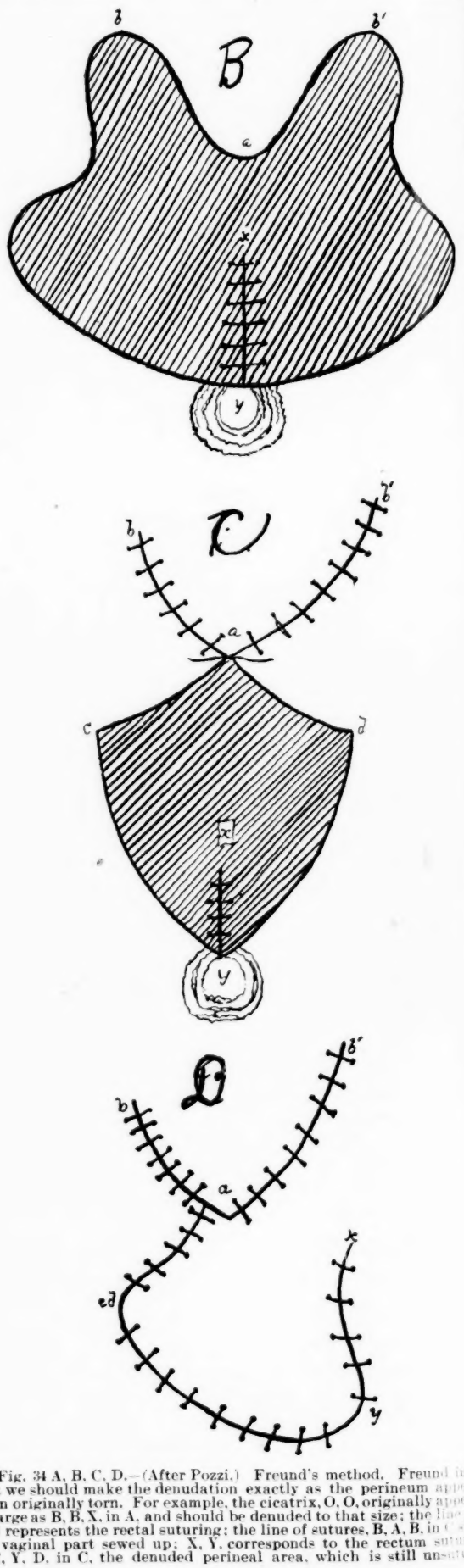


Fig. 34 A, B, C, D.—(After Pozzi.) Freund's method. Freund insists that we should make the denudation exactly as the perineum appeared when originally torn. For example, the cicatrix, O, O, originally appeared as large as B, B, X, in A, and should be denuded to that size; the line X, Y, in B represents the rectal suturing; the line of sutures, B, A, B, in C shows the vaginal part sewed up; X, Y, corresponds to the rectum suturing; A, C, Y, D, in C, the denuded perineal area, which is still unsutured;

the final disposition of the sutures in Freund's method. It is an excellent one, but complicated, and is wrought with much sacrifice of tissue if the operation fails.

fascia." It is fortunate that this "American" text-book does not represent the views of all Americans. The flap-splitting perineorrhaphy, in the hands of those who have thoroughly practised it, has proved absolutely that it will narrow the vagina, abolish a rectocele, and bring together the separated fibers of the levator ani fascia superior and inferior with the fibers of the levator ani muscles. Also it securely unites the ligamenta ischeo-perinei. The flap method is alike useful in partial and complete operations, and in high rectovaginal dissections does all that Emmet's does, with no denudations, and with a better chance of healing, by avoiding the infectious atrium. Also, like Emmet's operation, Tait's flap-splitting is founded on anatomic structures and designed to restore physiologic functions. Both operations have come to stay. The conception of the flap-splitting operation rests on the pathologic conditions of the wound. If one examines a vulva with lacerations, he will see linear cicatrices, narrow white lines which are transverse in dissection. These white lines are the healed cicatrices of the old perineal lacerations. The linear cicatrix is healed at right angles to the original wound or rent. Wounds generally heal in the direction of the tear.

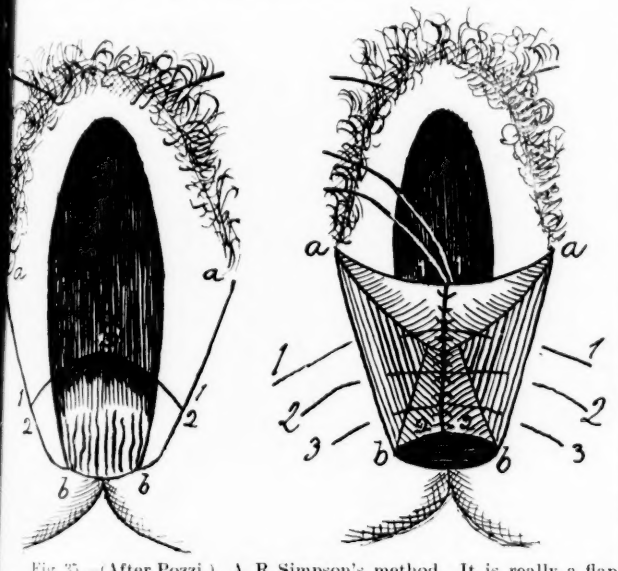


Fig. 35.—(After Pozzi.) A. R. Simpson's method. It is really a flap operation. In the left hand cut, *a*, *b* and *c* represent the lines of incision to make the flaps; S, vagina; 1, 1, vaginal flap; 2, 2, rectal flap. The scissors are first entered at *b*, and the point emerges at *a*, and then a clip is made; second, the scissors are entered at 1, and pushed between the vaginal and rectal walls over to 1, and a clip makes the rectal and vaginal flap. Dissect the vaginal flap from the rectal as high as the case requires. To do this, seize the vaginal flap with several small forceps, which the assistant can gently hold; also seize the rectal flaps with several small forceps and allow them to hang, as their weight is sufficient to put the flap on tension; with the two fingers in the rectum and a pair of blunt-pointed scissors the dissection of the flaps is conveniently made. The sutures are introduced as shown in the cut. Observe that in this operation four flaps are made and that the rectal and vaginal walls are sutured separately; also note that the sutures 1, 2, 3, are entered by passing through the skin. The suturing and flap making is absolutely different from that of Mr. Tait's flap method, in which only one flap is made and no sutures enter the skin or mucosa, and all sutures are in denuded tissue.

On this peculiar condition of the cicatrix being at right angles to the wound is based the flap-splitting method of Mr. Tait. The transverse cicatrix is split and sutured at right angles to itself. It simulates the Heinike-Mikulicz pyloroplasty when the wound is sutured exactly in the opposite direction to its incision. It is the same procedure as one may employ in varicocele to shorten the scrotum, i.e., incise the scrotum along the spermatic cord for three inches and then suture the scrotal wound at right angles to the incision as is practised in Dr. Senn's clinic. In suturing the split cicatricial wound at right angles to itself we restore exactly the original normal structures of the perineum. By this method the perineum and relations are restored to the normal condition, which

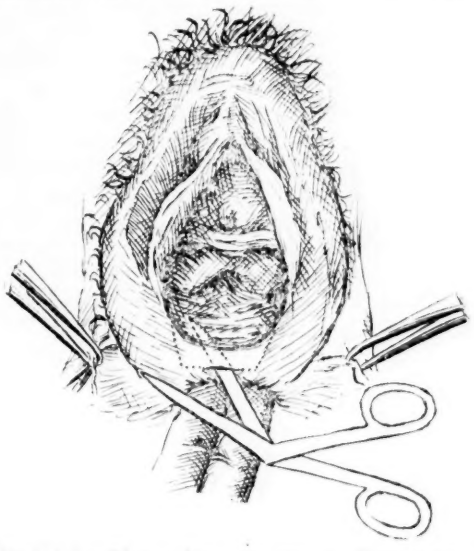


Fig. 36.—A perineal laceration to the rectum. Two fingers of the left hand are in the rectum; the recto-vaginal septum is put on lateral tension by the traction forceps on each side; the blade of the scissors is inserted between the rectal and vaginal walls, and the dotted line marks out the flap to be produced.

alone will withstand subsequent labors. The patient should be prepared for three days before the operation by cathartics, so that the digestive tract may be thoroughly evacuated. The cathartics should be so

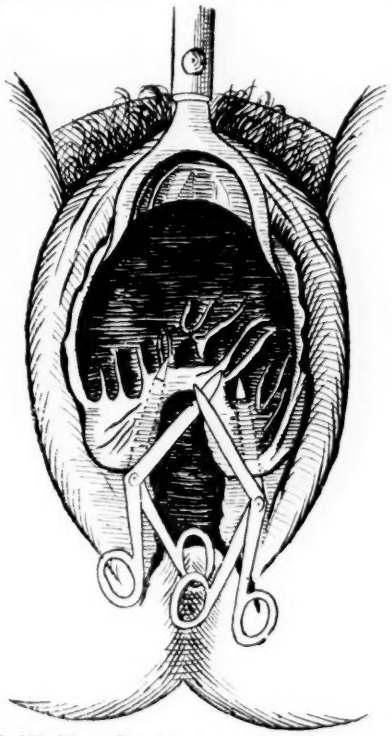


Fig. 37.—(Modified from Pozzi.) A very extensive recto-vaginal laceration of old standing, with large radiating cicatricial tissue showing healing lines. The scissor blades on each side introduced between the rectal and vaginal walls at the cicatricial margins illustrate how the flaps are produced. "Back cuts" extend to the scissor handles; the back cuts are made to produce a larger perineal body. A Sims' speculum is inserted into the vagina, anteriorly.

administered that all defecation should cease 8 to 10 hours before the operation. There will then be no feces in the rectum during the operation nor for some hours subsequent. The patient is anesthetized, and

lies on the back. The instruments useful in this operation are elbow scissors, a handled needle with an eye in its pointed end, and strong silkworm gut. The silk worm gut should be thoroughly washed with soap and water. The index and middle finger are introduced into the rectum, and the recto-vaginal septum is divided in the linear cicatrix. The scissors point is then forced under the skin of the labia and carried upward as far as desired and clipped. The opposite side is treated exactly the same. Back cuts are now made on each side of the rectum as long as desired. In slight operations the back cuts are not required. The anterior vaginal flap is seized with forceps and drawn forward, while the posterior rectal flap is seized and drawn backward. We dissect the rectum from the vagina as high as desired ($1\frac{1}{4}$ to 3 inches). At the same time the lateral space on each side of the vagina is dissected as extensively as is required to make the perineal body. (See Fig. 19) The two fingers of the left hand are kept continually in the rectum as a guide. The extent of the dissection is governed by the condition of the parts, the size of the wound, and the object in view; whether it be narrowing the vagina, extension of the perineum, or almost closing the passage for prolapse. With considerable dissection, a few arteries may need clamping; however, the hot irrigation will nearly always be sufficient to check the hemorrhage. If the bulb be cut it will bleed profusely, but sponge-pressure will soon check it. If the scissors cut open a vulvo-vaginal abscess the whole gland should be dissected out and disinfected, in order to avoid an abscess in the wound.

(To be continued.)

SOCIETY PROCEEDINGS.

Chicago Gynecological Society.

Regular meeting held Sept. 18, 1898.

The President, Dr. HENRY P. NEWMAN, in the Chair.

Dr. JOSEPH PRICE of PHILADELPHIA (by invitation) read a paper entitled

ABDOMINAL VS. VAGINAL SECTION IN PELVIC SURGERY.

He said it was very difficult to consider some of the opinions of recent adoption by surgeons with a judicial temper and impartiality. These different opinions had a surgical importance, in that problems arose, and their discussion would not and should not down until they were satisfactorily settled. If his own views were distinct and had something of a dogmatic ring, it was because they were forced upon him by actual experience and observation. Many practising the vaginal operation had the impression that the operation had not been universally adopted because physicians did not understand it; that it was difficult, dangerous, or impossible in their hands; that it required for its successful performance a peculiar aptitude, a special training and adeptness. This was a mistake. A number of men who opposed the vaginal operation had done it successfully; their mortality had been quite as low as that of those who advocated and made the procedure their adopted one. They did the suprapubic operation, influenced by the logic of their experience, by purely surgical and pathologic reasons, and it was the operation of their choice because it gave the most complete results, left less dangerous or annoying sequelæ, and less risk of the necessity for repeated operations. By the suprapubic route surgical cleanliness and surgical completeness were possible; by the vaginal they were not. The difference between the advocates of the abdominal method and those who critizised it was that the advocate spoke according to his knowledge and of the facts which actual clinical experience had confirmed; the critic according to his failures, disappointments and prejudices. The one had uniform success sustaining him; the other humiliating failures which inspired and gave color to his opinions. The French and Belgians were never successful in doing the suprapubic operation. The successful American, English and German operators had practised both methods for years, adopting the suprapubic procedure for tubal and ovarian disease, and the vaginal route for malignancy. The results of these men were uniformly good; they adapted their operation to actual pathologic conditions; they operated for actual disease, and not for all sorts of fancied conditions, or for vague nervous disorders due frequently to emotional susceptibility.

He said it was simply amazing how common it was with some operators to begin two distinct operations and complete neither. Good operators sometimes made a free opening into the abdomen, inspected and backed out, and then attempted the vaginal route and abandoned it after the puncture of one or more accumulations and drainage. The relief following mere puncture and drainage was only temporary. The drainage of one or more pus-pockets, where many existed in a large, tortuous, puriform tube or tubes, and where we had one or more ovarian abscesses, never cured. The only cure was the removal of the diseased member. He thought surgeons need only appeal to actual clinical facts in the experience of some prominent vaginal operators to show how difficult and incomplete their work was when they encountered deep-seated and complicated pathologic conditions, and also in how very many cases the result was fatal. In relation to results from any procedure, no reliance could be placed on the statistics of men who selected only favorable cases for operation and rejected the unfavorable. These men in his opinion had no right to compare their results with those of men who did not reject the desperate cases. Imperfect and incomplete work by the abdominal route was a feeble argument in favor of the vaginal. The fault was not in the procedure, but in the operator, his lack of wide clinical experience in dealing with gynecologic troubles or lack of surgical courage to complete the work he began. The removal of pathologic conditions was easier from above than from below, because the structures were more easily defined and lines of cleavage or enucleation were *from* important structures and not *toward* them or *into* them; there was no difficulty in securing arteries, as they could be seen and felt pulsating beneath the fingers. The operation was precise; it could be made mathematically certain in its limits; the incision was directly under the eye and under the absolute control of the fingers; it was not a stab about in the dark among vital organs as in the vaginal route; it enabled the easy freeing of omentum and bowel when adherent, and the repair of all disorganized parts. These were important considerations.

Careful examination of statistics coming from reliable sources went to show that abdominal pain continued in very many cases operated upon by the vaginal route and followed too many imperfectly, incompletely and ignorantly operated upon by the suprapubic method. These disagreeable symptoms complained of by patients after operation were nearly always the result of leaving omental and intestinal adhesions. The profession was too prone to talk about the septic uterus. A patient with a septic uterus was very ill and usually died speedily. There were few things that killed a woman quicker than a septic uterus. The essayist was daily doing sections, and while dealing with all sorts of complications and adhesions, dangerous twists and contortions, strong adhesions or fixation of crossed viscera, the sigmoid strongly adherent to the anterior face of the right tube and broad ligament, the cecum and appendix out of position and adherent, he could not but experience a sense of surprise that experienced surgeons (who have in the past done good abdominal work) could forget or ignore the lessons of their experience and deliberately extirpate the little healthy uterus and pass by pathologic lesions and complications constituting the real and only source of trouble. Surgery would be more judicious and successful if more care and skill were exercised in determining definitely the trouble for which operations were performed and the procedure strictly adapted to actual conditions. No one method should be pursued in all cases; the symptoms and conditions present must largely guide the surgeon in the selection of a procedure. It was important to select with great care the cases favorable to the application of any particular method. Sinuses were just as frequent and distressing in the vaginal vault as in the adbominal incision. Menopause nervous phenomena were about the same in both procedures, when completed.

In a series of 403 cases of vaginal hysterectomy, including about all conditions for which it was done, total general prolapse, etc., Jacobs had 9 fistulæ after the operations, yet he said that "subsequent fistulæ were exceedingly rare." He had observed 5 intestinal, 3 visceral and 1 ureteral fistulæ. Further, he remarks that "in most of the cases these fistulæ

isted prior to the operation; there were fistulous passages hich extended between the purulent foci and some part of he intestine. These passages were so large, and with walls so ell organized that the disappearance of the purulent pockets id not suffice to bring about the subsequent and spontaneous ure." In all such cases the speaker relieves adhesions, trims d repairs all lesions, with the most pleasing results, without y of the sequelæ of fistulous openings given by Jacobs as fol- wing the vaginal procedure.

D. FERNAND HENROTIN opened the discussion with a paper ntitled

THE INDICATIONS FOR INTERFERENCE BY WAY OF THE VAGINA IN PELVIC DISEASES: AN ANSWER TO DR. JOSEPH PRICE.

At the outset, he held that the vaginal route was a proper hannel to attack pelvic disease in women in certain selected ases only. As better inspection and palpation of the pelvic rgans could be obtained by an abdominal incision, it was con- eded that all patients to be operated vaginally must present pecial indications, and that in cases of doubt the abdominal ncision was most proper. In favor of vaginal section it may e said that where the same results can be obtained vaginally, his route should be accepted, as it avoids the abdominal scar, essens the shock and is much less frequently followed by hernia. Although one of the first to advocate the treatment of pelvic affections by way of the vagina in selected cases, he was most willing to admit that this method was not so much in vogue with experienced operators as it was three years ago, and for very good reasons, one of which was that our knowl- edge of the prevalence of appendicitis in conjunction with pel- vic trouble made it incumbent to operate by an abdominal incision when any degree of this affection was even suspected, and we had learned in later years that this condition was com- mon. The primary incision, whether it be through the abdomen above the pelvis, or through the vaginal vault, was to a degree always an exploration. The infinite variety of intra abdomi- nal complications made it so. This primary incision was as frequently curative by way of the vagina, and even more fre- quently so, than the abdominal cut. This was by reason of the ease and directness of drainage. The early vaginal inci- sion, to those who understood it and had the skill to perform it properly, was the ideal of conservative surgery. This inci- sion, like all vaginal operations, was only applicable to selected cases. By early vaginal incision was meant an incision that cures the localized septic pelvic infection in its very beginning, the woman remaining thereafter not only symptomatically, but physiologically perfect. It was particularly applicable to the treatment of acute ovarian abscess. This disease, he believes, is more common by far than is generally supposed. Its most general cause was abortion and trauma. It was the most com- mon extra-uterine form of pelvic sepsis that occurred following early miscarriages, criminal abortion and unclean surgical manipulations. After two or three days of fever the presence of exudate could usually be recognized at the sides or behind the uterus. This meant ovarian abscesses in eight or nine cases out of ten.

Vaginal hysterectomy was sometimes advisable, and in some cases was infinitely superior to any abdominal operation that could be performed on the same patient. Experienced opera- tors who were equally skilled in vaginal, as well as in abdom- inal work, were doing less vaginal work now than they were two years ago. At least, this was his belief; not because vag- inal hysterectomy was not a very proper and sometimes the best operation to be performed in certain cases, but because it was a radical operation and because the field of all radical operations had been much restricted for the last few years. Salpingectomy, ovarian resection, vaginal incision, had all done their share in the salvation of scores of uteri. While abdominal operators were improving their methods and per- fecting their results, the vaginal workers were developing the possibilities of the vaginal incision, and he claims today that one, if not the greatest of modern conservative gynecologic triumphs, is the thoroughly understood and properly per- formed vaginal section in selected cases. And there are many. As regards vaginal hysterectomy, it still had, in the opinion of the speaker, a perfectly defined position. In women necessa- rily sterile and approaching the menopause, where bilateral periuterine septic disease existed, and was situated low in the pelvis and with a roomy vagina, particularly in those with extensive and disseminated suppuration, who were low with septic fever, and especially where the abdominal wall was very fat, vaginal hysterectomy was still by far the preferable opera- tion, and when skillfully performed, in a large series would always give the best results. To demonstrate his own opinion as regards selection, Dr. Henrotin presented a table showing the frequency of vaginal as compared with abdominal incision, and the character of the intervention, from which it will be seen what an important factor the conservative operation has become, and frequently he believes vaginal section applicable. These operations were performed from January, 1897, to July, 1898. Reference is made only to such as were done for clearly defined pelvic disease, and the list does not include abdominal operations on the kidney, liver, gall-bladder, appendix, intes- tine (hernia) or any miscellaneous intra-abdominal work in which the internal genitalia were not involved. Of 180 such operations there were:

SUPRAPUBIC CELIOTOMIES, 132.

Conservative operations on the adnexæ, always leaving ovarian tissue and uterus	62
Double salpingo-oöphorectomy	4
Single salpingo-oöphorectomy for ruptured ectopic gestation	8
Myomectomy	3
Hysterectomy for fibroids	14
Hysterectomy for sepsis	8
Hysterectomy for prolapse	3
Miscellaneous operations for adhesions; ovarian, dermoid and intra-ligamentous cysts; sarcomas and hard ovarian tumors, etc.	30
	132

VAGINAL OPERATIONS, 44.

Early section for recent disease	8
Late section for old disease	18
Single salpingo-oöphorectomy	1
Section for large ovarian cyst, and its removal after tapping	1
Section for septic ruptured ectopic gestation	1
Hysterectymy for sepsis	10
Hysterectomy for fibroids	2
Hysterectomy for cancer	1
Hysterectomy for prolapse	2
	44

Vagino-abdominal operations for cancer, 4. Total, 180.

Dr. FRANKLIN H. MARTIN said that the best all-around gyne- cologist was the one who selected the operation suitable for the particular case in hand. It was impossible to do good surgery by operating suprapubically or by the vagina in all cases. It was his belief that all major surgery could be done best through the abdomen, as a rule, while all minor surgery could be done by the vagina. All surgery of importance should be done through the abdomen: 1, because the surgeon could see what he is doing; 2, he could do what he wanted; and 3, he could do it quicker. The cases he would reserve for the vaginal route would be those of carcinoma of the cervix of the proli- ferating variety, or flat cell epithelioma filling up the vagina, but which seldom extended beyond the cervix, and infected the lymphatic glands. In all other cases, where there was any question as to cancer involving the vagina, he would remove the uterus from above, and if later it was found that the glands were diseased, he would remove them also. Cases of double pyosalpinx, large fibroids, cystomata, and all cases of extra- uterine pregnancy should be dealt with suprapubically.

Dr. HENRY T. BYFORD held that to operate on all cases either suprapubically or by the vagina was unreasonable. He believed that just as efficient work could be accomplished by the vagina as through the abdomen. There were certain patho- logic conditions in the bottom of the pelvis in some cases that could not be operated as well from above as from below. He emphasized the importance of carefully selecting the cases for either route.

Dr. JAMES H. ETHERIDGE thought the discussion had the appearance of placing the advocates of the two operations in the attitude of rivals. He did not believe this. He held that we have two separate things to deal with, and that good work could be done by the vaginal or suprapubic method of operat- ing. There were cases in which the vaginal route was appli- cable, while there were others in which the abdominal method was suitable, and the wisdom and experience of such men as Drs. Price and Henrotin could define the limits of those cases to be operated upon vaginally and those that were best adapted to the suprapubic route. A strong objection to the vaginal route was that operators worked largely in the dark. Hemo- stasis was unsatisfactory and, added to this, there was danger of wounding the bowel. He had seen one case in which death was caused from wounding the bowel, but which was only dis- covered postmortem.

Dr. REUBEN PETERSON said that any one who had done con- siderable abdominal work must have seen cases that he dreaded to approach by the suprapubic route. For many years nearly all work was directed entirely through the abdomen in dealing with the pathologic conditions under dis- cussion. Each method had its field of usefulness and it remained for gynecologists to select their cases and choose the method to employ.

Further discussion of this subject was deferred until the next meeting.

Dr. EMIL RIES read an inaugural thesis entitled "Results of the Extended Operation for Carcinoma Uteri."

PRACTICAL NOTES.

Artificial Serum in Epilepsy.—De Fleury announces that injections of artificial serum enhance the effects of potassium bromid in epilepsy, so that much smaller doses are effective, with two or three injections of serum a day.—*Gazette Méd. de Liège*, September 15.

Creosote and Ichthyol for Tuberculosis.—H. Goldmann reports marked improvement in patients treated with ten to thirty drops of the following after each meal; Creosote carbonate, 15 grams; ichthyol, 15 grams; glycerin, 30 grams; peppermint water, 10 grams.—*Semaine Méd.*, September 7.

Gelatin for Gastric Hemorrhage.—V. Poliakov of Moscow reports a case of ulcer of the stomach with cardialgia, pyrosis and almost daily vomiting of blood for four months, which he treated with 10 per cent. gelatin three times a day, 2 c.c., for four weeks. It cured the hemorrhage and gastric pains, with no recurrence to date.—*Semaine Méd.*, July 27.

Automatic Kelene Tubes.—The *Gazette Méd. de Paris* mentions with approbation the automatic tubes for local anesthesia with chlorid of ethyl, which require but one hand, a novelty exhibited at the French Dental Congress, adding that experiments with chlorid of ethyl for general anesthesia now in progress promise very encouraging results.

Operative Dislocation of Goiter.—This is proposed by A. Wölfler for cases of inoperable goiter which threaten suffocation or interference with other vital functions. The goiter is detached from its bed, without disturbing the arteries, and transplanted to another place where it will not interfere to such an extent, usually higher up or farther around. He thermocauterized one case to reduce the size of the goiter, but he thinks it probable that the goiter would recede without this.—*Beiträge z. klin. Chir.* xxi, 2, in *Cbl. f. Chir.*

Mercury for Snake Bites.—The *Tribune Médica* of Rio de Janeiro, for June 10, describes the recovery of a young man after having beeen bitten by a cobra, causing in fifteen minutes intense headache, absolute blindness, copious hemorrhage in the spot, with alarming sweating of blood. He was given two grams of calomel and two of rhubarb at once, the spot disinfected, and the calomel kept up, six decigrams every six hours, until he had taken five doses. The writer has cured 128 persons with this treatment.

Subcutaneous Rupture of Large Arteries.—Traumatic occlusion of the large arteries from immediate obliteration, or a gradual obliteration from thrombosis, may heal without accident, but it is usually followed by gangrene—thirty out of forty cases. When called at once, and the indications of arrested circulation are noted, the first step is a careful disinfection of the skin, followed by wrapping the member in a thick layer of cotton without compressing it. This will prevent septic complications and if gangrene does occur, the chances are in favor of its remaining localized. The extent and gravity of the gangrene will also be reduced if the collateral circulation is promoted with prolonged hot baths. As the gangrenous accidents proceed less from the localized traumatic lesion of the artery than from the consecutive thrombosis and compression produced by the effusion of blood, it is wise to open into the periarterial sanguine focus, at least during the first few hours after the traumatism, evacuate it and ligate the ruptured vessel. At a later period, if the gangrene is menacing, high amputation may be required, but sometimes unexpected results are obtained with embalming, combined, if necessary, with extensive incisions, injections of very hot boiled water and wrapping in compresses dipped in alcohol. When the gangrene is dry and circumscribed, radical intervention should be postponed as long as possible, as it may prove unnecessary.—*Revue de Chir.*, April and June, 1898.

Lead Oxid Test for Urine.—Loubiou recommends the following simple test as very sensitive to small amounts of albumin, rapidly clarifying the most turbid urine. 1. Put 10 c.c. urine in a test-tube with one drop of phenol phthalein and add normal sodium drop by drop until the fluid is slightly pink, reversing the tube on the thumb after each drop of sodium. 2. Add 1 to 1½ gram of lead oxid; shake well and filter. 3. The pinkish tint is removed by the addition of a few drops of Tanret's reagent. The fluid is then brought to the boiling point and the albumin precipitated as usual.—*Bull. de la Soc. de Pharm. de Bordeaux*, July.

Midwifery Practice.—Muir (*Annals of Gyn. and Ped.*, September), in "Notes from Midwifery Practice," says that 75 per cent. of the gynecologists, so called, live from errors or incidents occurring during the parturition state, and that seven-eighths of the women coming under his observation (about 1600 confinement cases) for treatment, have been delivered by forceps. "Many a first-class, honest, careful physician is turned to one side because he gives his patients time to be delivered naturally, and another employed simply because he has the reputation of not allowing his patients to suffer, but uses chloroform and instruments early. The latter is the man who gives the gynecologist his inning." His rule is to never remove the placenta until he can feel the insertion of the cord quite easily, and he never gives ergot unless he knows his patient's habits and that it is indicated; he gives it hypodermatically. "Another thing I have learned by experience," he says, "is never to underrate the idea of the patient that things are not right. Time after time, I have been told this, but thinking it only some hallucination on my patient's part, afterward I have learned to my surprise, if not regret, that she was correct." In breech or foot presentations he has found the pain continuous, and in some cases was obliged to resort to chloroform, slightly, on account of the severity of the pain. He has never noticed an excessive quantity of liquor amnii in breech or foot presentations, but has in a case of club-foot. Whenever he has found an excessive quantity of amniotic fluid, the pains have been continuous from the first, also excessive and unnatural, and the patient has believed all was not right.

Fritsch's Incision in Cæsarian Section.—Steinthal (*Centralbl. f. Gyn.*, April 9, 1898) reports a case of Cæsarian section illustrating a complication which may arise in delivery through the transverse uterine incision of Fritsch. The patient was 34 years of age, and exhausted by long labor. The cause of obstruction was a myoma. Steinthal performed Cæsarian section by the method of Fritsch. There was little hemorrhage, as the uterine and ovarian arteries were controlled by manual compression. The child was partly extracted by the feet, but the head was held firmly in the uterine wound. It could be released only by making a vertical incision in addition to the transverse. An elastic ligature was then passed over the uterus down to the tumor. The placenta was extracted with but slight loss of blood. The tumor was found to be a subperitoneal growth with a broad pedicle, springing from the posterior surface of the uterus at the level of the os internum. Several knuckles of intestines were adherent to the tumor and had to be separated. Hysterectomy was performed, and the stump stitched to the lower angle of the wound. The author remarks that the object aimed at in the transverse incision was defeated by the necessity for adding the vertical section. Dr. C. Jewett (*Brooklyn Medical Journal*, September) believes Fritsch's incision can scarcely have any advantage over the longitudinal, provided the cut is confined to the upper or fundal portion of the uterus. Transverse section does not necessarily avoid the blood-vessels. Incision strictly in the median line would probably result in no more hemorrhage. Moreover, the vessels are easily controlled by manual compression or by the use of the cervical constrictor. All the advantages claimed for the transverse incision are realized in the longitudinal, by limiting the uterine wound to the thickened upper portion of the uterus.

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SATURDAY, OCTOBER 8, 1898.

THE ANTITOXIN TREATMENT OF PNEUMONIA.

Dr. ANDREW H. SMITH of New York, in a recent paper[1] with the above title, read before the Association of American Physicians in May, states that it is very likely that in ordinary pneumonia there must be infection with succeeding generations of microbes. WELCH and others have shown that the virulence of the micrococcus lanceolatus is greatest when the coccus is youngest; that the most virulent microbes come from the edges of the consolidation. When the local process ceases to advance, it means that then young micro-organisms are no longer produced. This might be a reasonable explanation of the remarkable crisis in pneumonia, and yet the question arises, what share do the antitoxic products play in the result?

As long ago as 1888 NETTER[2] showed that mice and rabbits can be made immune to the micrococcus lanceolatus by injection of fluid from the dried spleens of infected animals. FOA observed that attenuated cultures of the micrococcus may render an animal immune for several months. Taking the serum from an immune animal, he was able to produce immunity in a second animal by its injection. The KLEMPERER brothers verified these observations. They also found that dogs may be protected against pneumonia by the use of serum of immune animals. This serum does not kill the cocci in the body, but prevents the formation of toxins in the infected animal, either by hindering the toxicogenic powers of the cocci, or by rendering the toxin inert after it is produced.

[1] American Journal of Medical Sciences, October, 1898.
[2] Quoted by Smith, loco citato.

The KLEMPERERS also showed that man is but slightly susceptible to the action of the micrococcus lanceolatus, especially to its action when injected subcutaneously. They conclude that in man it is not the exudation into the lung substance that renders pneumonia such a grave disease, but the general intoxication that results. Eventually antitoxin is produced and recovery may result. Serum taken from patients after the crisis, is found to have a curative action in dogs, and the crisis in human pneumonia is due to the production of antitoxin. The resulting immunity is in man only temporary, and while we await the formation of antitoxin we treat pneumonic patients by supportive measures, but in the meantime the old and weak die.

By using the antitoxic serum from animals apparent benefit in hastening the crisis has been observed, but a final conclusion as to the value of the treatment has not yet been reached. The following are some of the observations in regard to the serum treatment of pneumonia:

LARA used the serum of immune rabbits and dogs, as well as a glycerin extract from the viscera of immune animals; the latter was accompanied by less disturbance, producing no general symptoms. The crisis occurred in from three to five days; the convalescence was rapid and complete, and the reporter considered the results of ten cases thus treated as encouraging. BOZZOLO treated five cases with rabbit serum; the temperature fell rapidly in each case. Four recovered and one died after the crisis. DE RENZI states the results obtained by using antipneumococcic serum as decidedly encouraging. WEISBECKER obtained marked improvement in the subjective conditions very soon after the injection of serum obtained from patients recovering from pneumonia. One of the patients in whom these favorable results were observed was a 3-year-old child. The distressing subjective symptoms in many cases disappear as if by magic. WASHBURNE[3] in 1897 employed the serum of a pony which had been treated in the same manner as is now done in manufacturing diphtheria antitoxin, and this serum possessed marked protective powers. In some very unpromising cases this serum seemed to act favorably.

From this review of sero-therapy of pneumonia SMITH properly concludes that no decisive results have been obtained, but that there is sufficient to warrant further effort. There are very many difficulties in the way of this work. The extreme variability of the virulence of the micrococcus lanceolatus, and the corresponding uncertainty of the strength of the toxins produced are serious obstacles. Again, animals readily immunized may lose their immunity, and the serum from them becomes worthless. Hence conclusions can be established only with the greatest difficulty. Applying these laboratory observations to

[3] Journal of Pathology and Bacteriology, 1897.

the clinical study of pneumonia, it will at once be seen that the difficulties are still further increased. It is to be hoped that WASHBURNE'S method of maintaining the virulence of the pneumococcus at a given point for a longer time may result in the production of a reliable antitoxin, and when a reliable antitoxin can be manufactured then the value of this treatment of pneumonia will soon be determined.

THE MARRIAGE OF THE UNFIT.

It comes, from time to time, within the editorial scope of the JOURNAL to notice propositions from medical sources to advance the public welfare by legislative or other limitations of the liberty or capacity of the individual to reproduce his species. Sometimes it is in the form of a proposal to castrate criminals, sometimes in that of proposed or attempted legislation against the marriage of epileptics or other defectives, and it is not very long since, if we remember correctly, that a bill was before a certain State legislature to have appointed a sort of board of health to pass on the physical and mental—and we trust also the moral—condition of all candidates for marriage. A similar proposition was, it is believed, also offered in France, but went no further than the medical, and probably some of the secular, journals; the conditions there at the present time exciting more anxiety on account of quantity rather than of quality of the population. As a medical question, however, it is still a living one, and probably will be until our medico-sociologic ideals and theories have more fully won their way into the practical usages of life, and can be effectively embodied into actually enforceable laws.

In the London *Lancet* of September 10, Dr. HARRY CAMPBELL publishes an article on "The Marriage of the Unfit," that is as radical in its views, if not in its actual proposals, as any that have appeared upon this general subject. He would prohibit or discourage marriage by, not only those who have suffered or are suffering from insanity, epilepsy, tuberculosis, heart disease, etc., but also by all who have or have had rheumatic fever, strangulated hernia, ovarian cyst, congenital defects of hearing, or any one of the chronic or acute functional nervous disorders; in fact, he would prohibit marriage altogether to that large class who are included under the general head of neurotics. While he does not propose legislation to this effect he holds that, as physicians, we should use all our influence to prevent marriage by those suffering from the above-named disorders and do our utmost to create such a higher ethical standard upon physiologic questions of this kind as would secure that such a self-denying ordinance could be possible on the part of the public that is specially concerned. He goes even further in his enthusiasm for the welfare of the race; while, from a sociologic point of view, he condemns polygamy; as a biologist, he regrets its discontinuance in civilized communities, and wishes that it could be utilized for multiplication of the progeny of our athletes and intellectual giants.

The basal idea of Dr. CAMPBELL'S argument appears to be that, while natural selection is interfered with in the human species, the subsequent modification of the process called by WEISSMANN "panmixia" is still more interfered with, and the result is a racial deterioration. Mankind does not advance physically by natural selection and does not adapt itself to its environment by panmixia for the simple reason that every one follows blindly his impulse and recklessly procreates, whether fitted for the function by a good heredity or not. Heredity is universal; the structure of any organ determines its reactions to any given environment, and structure is determined by heredity. Hence, according to his theories, the importance of an unexceptionable heredity and the need of restricting marriage where such does not exist.

The weak point in Dr. CAMPBELL'S argument—and it is the same in other similar statements of theories that would restrict marriage to any general or large extent—appears to us to be chiefly in that it does not take due account of the fact that Nature, in the operation of natural selection and panmixia, does not produce its results except through numerous experiments and failures, so to speak, and that these are as essential in its processes as are its successes. If we could eliminate all morbid or variable heredity in humanity or any section of it, it would require an absolutely unchanging environment to preserve its immunity, and progress in any direction would be perilous or impossible. The higher the state of culture or civilization the more complex are the conditions or problems of evolution and the more difficult will it be to modify them by any mere legislative restrictions or even by recommendations of individual self-restraint. We may advise as physicians but it would be presumptuous for us to expect our professional opinions to often outweigh the strongest personal impulses, to say nothing of social and other factors involved.

The State can reasonably interfere in prohibiting the marriage of the insane and also—perhaps, with less prospect of success—that of the tuberculous and epileptics. As regards the other disorders mentioned by Dr. CAMPBELL, it is hardly likely that even medical advice will be often asked, much less accepted. When we take account of all the vicissitudes of nervous and mental development and the absolute lack of any positive normal standards, any wholesale discouragement or even disparagement of the marriage of neurotics—including under this head all those who have suffered from functional disorders—might in certain points of view seem actually perilous to the welfare of the race. The existence of a functional nervous disorder may be only an incident of a higher evolution, not by any means an indication of deterioration demanding the extinction of the family of the possessor.

RENAL STONE.

One of the most curious facts of our latter day science is the correction of statements of symptoms which have been calmly accepted by medical writers for many years. It is perhaps too much to expect of a writer that he should have personally verified all statements of which he is the accredited author. Indeed, the experience that would warrant one to write a book on such terms would take several centuries of constant clinical work and study to acquire. Thus it is then that assertions made by many writers become finally elevated to the dignity of facts, and it is not until some self-assertive scientist, who only believes what he himself is able to prove, happens upon the scene, that the flimsy foundations upon which some of our most important diseases are constructed become suddenly undermined. Again, with the accession of new instruments of precision many new symptoms are necessarily added and others are proved to be false.

The introduction of the centrifuge into the examination of urine has elicited many facts not before in evidence, on account of the chemic changes occurring in this excretion during a lengthy sedimentation. This instrument has brought out some new facts in regard to renal stone as related by MUSSER. It has always been held by all authorities, and text-books have so stated for many years, that while hematuria is a common symptom in renal calculus, the appearance of blood is intermittent and can usually be appreciated by the naked eye. MUSSER has shown in some twenty cases that blood is persistently present, that is to say, from week to week, though individual specimens may occasionally show an absence of red cells after the usual examination. While acknowledging an intermittent macroscopic hematuria, he claims and bears out his claims with laboratory facts, that blood in the urine is, in stone, a practically constant symptom, though oftimes the microscope becomes a necessity for its clinical demonstration. "A few corpuscles only may be found, but one alone means hematuria." With the older writers, hemorrhage not appreciable to the naked eye necessarily escaped attention; and this latter symptom occurring only at irregular intervals, bears out their statements of an intermittent hematuria. Thus it is with the introduction of new instruments: symptoms once looked upon by us as well-grounded, must, as a matter of course, undergo more or less change.

On the other hand, a symptom assumed by almost all the writers on this subject as of constant occurrence, pyuria, is claimed by MUSSER to be frequently absent. He says: "Of the twenty-eight cases I examined, in fifteen there was no pus; in six a few cells of a very small quantity was found (four, womb, cause obvious); in one it was noted as considerable (old gonorrhea and syphilis, four examinations); in one only a small quantity (male, cause assignable); in one it was small in amount, twice only in some fifty examinations; in one it was abundant and due to genito-urinary infection as well as pyelitis." That the diagnosis of calculus was correct in these cases, subsequent operation or colic with the passage of the stone proved beyond a doubt. From these facts, thoroughly worked up as they have been, the author is justified in his statement that pyuria is not a symptom of stone, except that there exist in addition to the calculus, some other lesion or lesions of the genito-urinary tract, which latter could of themselves account for the pus.

In the microscopic examination of his cases, MUSSER has in many instances found hyaline casts, long and thin, undoubted evidence of renal irritation. Other forms of casts do not occur unless a co-existing nephritis be present. This point, together with the presence of a small amount of albumin in a urine of high specific gravity, he looks upon as of great importance both from a diagnostic and prognostic outlook. Here we have a symptomatology formulated, at once greatly opposed to the previous ideas held upon the subject, and it is to be hoped that further and more extensive observations will be made, that the diagnosis of this important affection shall not be compelled to remain in doubt.

ACROSS THE PACIFIC IN TRANSPORTS.

Manila is a long way from the United States. The troops of the first expeditionary force sent out to support Admiral DEWEY passed thirty-seven days on shipboard before coming in sight of the scene of their future operations. They embarked May 24 at San Francisco, Cal., and reached Manilla bay on June 30. It takes a much longer time for detailed medical reports of the voyage to make the return passage across the ocean and the continent to the Surgeon-General's Office at Washington, D. C., because they have to pass through so many headquarter offices while en route. Sanitary reports are called for by the Surgeon-General on the last day of every month, and some of those written June 30 by medical officers who accompanied the expedition have but now reached their destination. These give a brief but interesting view of the conditions affecting the troops on their long voyage; and in them there is nothing of the sensationalism which attended the movements of nearly every troop-ship on the Atlantic side of the country.

The steamship *Australia*, which carried General ANDERSON, his staff and 777 officers and men of the Second Oregon Infantry, was a passenger steamer hastily fitted out as a troop-ship. The berths were originally planned to be in sections of five abreast and three tiers high, but as it was considered that this would crowd the men too much, the middle row of berths was removed from each of the sections so as to have an aisle or free passage-way between every set of two rows. Major M. H. ELLIS, surgeon of the regi-

ment, regarded these berths as commodious and comfortable considering the conditions. The men occupying those parts of the vessel that were most crowded or least desirable were permitted to bivouac on the main and hurricane decks in favorable weather, and the weather was favorable during no less than thirty-five of the thirty-seven days. The *City of Sidney*, which touched at Guam Island, carried 398 officers and men of the Fourteenth U. S. Infantry, 343 of the Second Oregon Infantry, 21 marines and 60 Spanish prisoners, without inconvenience or overcrowding, according to a report by Captain H. E. McVAY, assistant surgeon, U. S. Army. The water-supply was pure on both vessels. It is reported of the *Australia* that after leaving Honolulu the issue of water was kept under careful surveillance to prevent waste. The average daily consumption by the troops and crew was 1,200 gallons, of which one-half each day was condensed and filtered through charcoal. All refuse material was thrown directly into the sea, and the latrines were constantly flushed with running water. The food-supply was ample, although bacon was but little used. Dr. ELLIS considered that the absence of fruit from the food issued to the men, with the sedentary habits necessarily imposed upon them by confinement on board ship, was productive of a tendency to constipation. Dr. McVAY characterized the clothing as wholly unsuited to the climate. The blouse, cap, campaign hat and underclothing were all too heavy, and the overcoat a mere incumbrance. Canvas uniforms were issued during the voyage to the troops on the *Australia*, but these were found also to be too heavy. It is to be noted, however, that after the arrival at Cavite light underclothing and gingham blouses were immediately issued; and it is reported that the campaign hat proved more serviceable than was expected, for during the heavy rains it was preferable to the cork helmet.

Notwithstanding the difficulties in the way of effecting cleanliness of the person and of the clothes, the condition of the troops at the end of the voyage was commendable. On the *Australia* the underclothes of the men were regularly exposed to sterilization by steam in the absence of laundry facilities. The health of the men was good. Measles prevailed on the *City of Sidney*, but no case was serious. One death occurred on this vessel from appendicitis, for which operation was performed.

These records of pleasant and healthful voyages on the Pacific lead us to consider whether the War Department, under whose orders they were made, should be held responsible for the sickness and suffering incurred on other troop transports sailing under similar orders and under the same military regulations.

Suicides in Italy.—During 1897 suicides numbered 1997, which corresponds to a mortality of 8.41 for every 100,000 inhabitants. The majority of the cases were in provinces where the ratio of illiteracy was the lowest.

CORRESPONDENCE.

Camp Thomas and the Second Division Hospital—The First Army Corps.

INDIANAPOLIS, IND., Sept. 24, 1898.

To the Editor:—In view of the great concern now being manifested with regard to our military hospital service, I feel that a short statement as to the real condition will not be amiss.

Leaving Indianapolis as Surgeon of the One Hundred and Fifty-eighth, with Dr. H.I. Jones, First and Dr. Paul Barcus, Second Assistant-Surgeon, we reached Chickamauga, May 18, 1898. The country was slightly rolling, with an almost regular alternation of wooded and open land. Everywhere were evidences of a lime formation, with many vertical out croppings of the strata. In the necessary trenchings the soil was found to be a clay so impervious to water that collections in sinks, etc., would evaporate rather than seep away into the subsoil. Owing to the rocky formation at the depth of about seven feet, sinks were at that time a practical impossibility. On May 25 I was ordered away from the regiment and detailed as Division Surgeon, having charge of the Second Division Hospital, First Army Corps. At this time there was more or less confusion in all departments, nor could anything else be expected. There were thousands of troops pouring in daily, few of whom were experienced in the matters of government account, all eager and questioning as to their individual duties. It is a matter of wonder that the service was conducted so well. We were on the line of the Southern R.R. and traffic was tremendously congested, the time not having allowed of building of switches and facilities for loading and unloading cars. For a short time it was a question of doing the best that could be done until these faults might be remedied and the various departments maintained with some system. I saw no instance nor heard of one where these temporary delays caused either suffering or hardship.

Early in June I was ordered to begin the formation and organization of the Second Division, First Army Corps Hospital. Police details were made, and requisitions forwarded asking for the necessary supplies. These could not always be immediately had for the asking, but never was I told to "rustle" for myself. The officers at the supply stations were universally courteous, and particularly Major Comegys, Chief Medical Purveyor. With certain articles not at hand, the question would naturally follow, when can I get them? Whereupon the reply would likely be: "I can not say definitely; they have been shipped and as soon as they reach us you will be welcome to them." Often the invoice would be shown showing date of shipment from the contractors. This uncertainty was, I suspect, in a large measure due to inadequate railroad equipment and an enormous shipment of all sorts of supplies. As time went on these difficulties were obviated and delays became fewer and fewer. The hospital was soon opened, the regular United States army hospital tent being used; these were floored. The natural drainage of the site was good. Our water-supply came from distant springs, being hauled in new, clean, sweet oak barrels. Later, filters were added to our equipment, and the question of water-supply was settled for all the time we remained in Chickamauga. Food was always sufficient and of good quality. On rare occasions the milk-supply would be found sour, leaving us until the following day short of this one article of diet, which was invariably made up by soups, broths, bouillions, etc. The medical supplies and surgical outfits, so far as essentials were concerned, was ample. Men with pet remedies and hobbies would probably have been disappointed. Flies were present throughout this great camp in unnumbered millions, but for this the medical department refuses to assume responsibility. We met this

annoyance by use of musquito nettings. The success of the measure was not complete, for much of the time the weather was close and sultry to an extreme. In going through the wards these nettings would be found wadded up and lying on the foot of the patient's cot or on the floor, with the explanation that it was thought to be cooler without them, that "they stop the breeze," etc. So, in many and the majority of cases, these sick boys chose what little breeze might be finding its way into their quarters, and fanned the flies away in preference to being covered by a mosquito-bar. When we left Chickamauga it was with 100 large, new, unused and uncalled for mosquito bars.

As to the criticism of their being too many autopsies, personally I remember of but two, and there was a universal feeling that where it could be dispensed with it should be so in consideration of "the folks at home." This criticism is uncalled for and absolutely can not be substantiated. Up to the time of treating about 900 patients there had been but fourteen deaths, one of these a broken neck, another a typhoid hemorrhage that occurred on the night of the afternoon of admission; still another of cerebral effusion, when death occurred on the same day. These are just three of the fourteen that I happen to recall, and when you consider the seriousness of the class of cases treated, the record can stand almost without a challenge. Inspectors from the Medical Department at Washington were frequent in their visits, and their reports gratifying to the entire hospital staff.

In the One Hundred and Fifty-eighth Indiana, during the almost five months, there have been but five deaths, and this an organization of over 1300 men living under new and perhaps adverse circumstances, and certainly with a most radical and complete change in their habits of living. This, I believe, will speak for itself. Instead of indulging in cheap criticism I would rather feel the gratification of great work accomplished in wonderfully short time and practically without any preparation.

FRED R. CHARLTON, Major and Surgeon,
One Hundred and Fifty-eighth Vol. Infantry.
224 North Meridian St.

Judge Kohlsaat and the Probate Court.

CHICAGO, Oct. 3, 1898.

To the Editor:—As long as the medical profession prides itself on keeping out of politics, it will be discriminated against by the politicians and the courts. The action of Judge Kohlsaat toward our profession and our bills has become so outrageous that it is of vital importance that we take steps to protect ourselves from his lawless treatment. The judge has made some rulings about which every one of us should know and we should thoroughly understand their effects on our welfare. There have been many criticisms of his arbitrary rulings, but two in particular, which are thoroughly authenticated, I will give. It must be understood that only claims against estates come up in the probate court. The two decisions which, according to his own statement, are permanent in his court, are as follows: First: "I will not allow more than one doctor bill against an estate." This statement was made to the writer in the presence of Dr. Bayard Holmes. Dr. John A. Robison is authority for the second, which is: "I will not allow any doctor's charge of more than $2 a visit." But few words are needed to emphasize the utter injustice of these decisions. Not one operation in a thousand can be safely performed by one doctor working with other than professional assistance. It is essential to have two or more physicians at every operation of importance, but only one of them can secure remuneration for his services before Judge Kohlsaat. I have a patient who lives nine miles from my home and at every visit I spend an hour dressing two large suppurating wounds. Judge Kohlsaat thinks $2 ample remuneration for this work. A short time ago I was called out at 1 o'clock A. M., and found a man with impaction of feces, in pain like a woman in labor, with perineum bulging two or three inches under the involuntary straining, the patient in imminent danger of rupturing an intestine or a blood vessel. I spent three hours with hot soap water, an irrigator and a spoon in removing the contents of the rectum and opening up the bowels. A more disagreeable task it would be hard to find, and yet had my bill come before Judge Kohlsaat he would have considered $2 ample pay.

If Judge Kohlsaat's decisions were in accordance with the law, an anesthetist could not recover pay for his services and neither could the consultant. There would be nothing left but for them to demand their fees before responding to a call. I have no doubt that Judge Kohlsaat has many times, as a lawyer, charged, in his office during office hours, $10 for answering a question involving a few hundred dollars. Some lawyers have told me that it is the probate judge's business to protect estates. I understand that it is the province of a judge to see that justice is done between ligitants, and not to take one side or the other under his wing and waive off all claims whether they are just or not. If it is foreordained that one judge is to decide all cases which come before him in favor of the defendant, and that another will decide all cases coming before him in favor of the plaintiff, we might as well abolish courts altogether. People who inherit money are very apt to grasp at every dollar and to be unwilling to pay even the most sacred obligations of the man who accumulated the money and left it to them. There are altogether too many men who are willing to live at the expense of others, and particularly are they willing to be parasites on the medical profession. But why should such avaricious parasites be the special wards of a court that has been instituted to the end that justice and not injustice prevail? Judge Kohlsaat has allowed three liquor bills against one estate, but he will not allow more than one doctor bill. Are liquor bills three times more important than doctor bills? Judge Kohlsaat seems to think so. It is likely, however, that liquor dealers are three times more active in politics than doctors are. If we, as a profession, will be a little more active in politics, we will be treated a little more respectfully by politicians and by courts.

Judge Kohlsaat arrogates to himself the right to establish for our profession a fee-bill and to control our method of doing business, and since he does so he is not a fit man to hold the position he occupies, and I propose that we unite and oppose his re-election with all the influence at our command. I now have the names of twenty-five republicans who have promised to vote against him at the coming election, and if each doctor who is in sympathy with this protest will get ten republicans to vote for his opponent, we can defeat him and then we may hope to have our position in the community respected and our services appreciated even in the probate court.

D. H. GALLOWAY, M.D.

Tubal Pregnancy at About Two Weeks.

WASHINGTON, D. C., Sept. 27, 1898.

To the Editor:—The report of the case of tubal pregnancy with rupture at about the fifth week, by Dr. J. E. Cowles of Los Angeles, Cal., in the JOURNAL of September 17, recalls a case of early pregnancy in which I made a postmortem examination April 4, 1893, on the wife of a physician who had suddenly died. She was 28 years old and had been married ten months. Her menses had recurred regularly, the last period being about the middle of March and unusually profuse. March 30 there was a show of blood by the vagina, two weeks after cessation of the last flow; April 2, sudden nausea, vomiting and tendency to collapse but no pain. Death next day, about twenty-four hours after these symptoms appeared. The postmortem examination showed a general bloodless condition,

and a large quantity of blood and clots in the pelvic cavity. The uterus was three inches long and contained a decidua. The right tube just beyond the tubo-uterine junction was somewhat enlarged and showed on its upper side an opening of rupture. The ovum was found and was about two weeks old, the membrane and villi distinct but the embryo not distinguishable. The right ovary contained a corpus luteum. There were old peritoneal adhesions around the left tube and ovary. The specimen is in the museum, No. 10,545. The husband stated that intercourse occurred on the second or third day after cessation of menses.

D. S. LAMB, A.M., M.D.,
Army Medical Museum.

PUBLIC HEALTH.

Variola and Tuberculosis.—Landouzy called attention ten years ago to the fact that variola predisposes to tuberculosis, and Lop now reports sixty-four observations that confirm the statement, with fifty-four from Professor Revilliod and twenty-two from Chauvin. The tuberculosis is more severe as the intervening period is shorter.—*Bulletin de l'Acad. de Méd.*, September 6.

Treatment of Nervous Dyspepsia.—Murdoch (*N. Y. Med. Jour.*, September 24) believes strychnin and electricity the most efficient agent in restoring the lost balance of the secretory nerves, while bathing is not to be neglected and diet to be properly regulated. Much patience is required on the part of both patient and physician. Often patients take too little food, only increasing the difficulty, the stomach also suffering from lack of nutrition.

Venereal Diseases in the Russian Navy.—The report of the Sebastopol division shows that the strict hygienic measures, careful medical supervision and instruction of the men in regard to venereal diseases by popular lectures, reduced the number of cases from 887 in 1893 to 556 in 1894. The number of soft chancres fell from 297 to 70, and the proportion of venereal diseases in the hospital from 45 to 25 per cent., in spite of the constant increase in the number of the marines.—*St. Petersb. Med. Woch.*, September 4.

Nitrous Poisoning By Canned Food.—A special committee of the London Chamber of Commerce has for some time past been engaged in investigating cases of alleged poisoning through eating tinned foods, with the result that it has generally been found that such allegations were unfounded. The latest case investigated was that of a young woman whose death was said to be due to ptomain poisoning consequent on eating tinned salmon, the contents of her stomach having been analyzed by Dr. Stevenson of Guy's Hospital, the well-known Government expert. Dr. Stevenson's opinion was that the death was due to poisoning by niter, and could not be attributed to ptomain poisoning through eating tinned salmon. In the course of his evidence Dr. Stevenson said that if, as had been stated, as many as 209,000,000 tins of food were consumed in one year, the cases of poisoning were infinitesimal. His opinion was that so far from ptomain poisoning being specially identified with tinned provisions, it also arises in connection with fresh meats of all kinds.

Yellow Fever.—Since the reports from the South, in our last issue (p. 803), the press dispatches have given the following data: September 27, 5 new cases were reported at Jackson, Miss., 4 at Taylor's Station, 2 at Orwood, 4 deaths at Oxford, 1 new case at New Orleans, with 1 death, 8 cases at Wilson, and 5 deaths at Franklin, the total cases at this town being 129 to date. The reports for September 28 give 5 new cases at New Orleans, with 1 death, 11 new cases at Wilson, 8 at Franklin, 1 at Oxford, Miss., and 2 suspicious at Clinton, near Wilson. September 29, New Orleans reported 1 new case, Houma 1, 4 at Wesson, 8 at Franklin, 2 at Taylor's Station, Miss., and 3 at Oxford. Six new cases at Wilson, 13 at Franklin, and [illegible] at Jackson, Miss., and 6 with 2 deaths at New Orleans, mak[illegible] up the record for September 30, while October 2 reports gav[illegible] 2 new cases at Taylor's Station, 1 at Oxford, 10 at Jackson, [illegible] and 2 deaths at Harriston, and 1 suspicious case at Port Gib[illegible] son. As we go to press, dispatches of October 3 announce [illegible] counties and 13 towns infected in Tennessee. The Port Gib[illegible] son case is declared genuine; 1 new case at Jackson, 2 a[illegible] Water Valley, and 16 with 1 death at Oxford.

School Quarantine in Diphtheritic Cases.—Dr. Hand of Philadelphia has offered a suggestion which, if fully and officially confirmed, will tend to lighten the onerous treatment of scholars, teachers and nurses in our public schools and elsewhere who have been the subjects of school-detention on account of diphtheria. His suggestion is not unreasonable, and it appeals to our conservative feelings, in that it appears to open the way to a reduction of the term of ostracism now regarded as necessary by very many of our health officials. He has recommended a solution of nitrate of silver, 60 grains to the ounce of water, to rid the throat of bacilli after the disappearance of diphtheritic membrane. Often after the throat is entirely clear and the patient apparently well, examination shows that bacilli are still present. In such cases quarantine must still be observed. Hand reports good results from this method, the bacilli usually disappearing within a very few days. The solution should not be used until the membrane has disappeared. Now it may be that the silver solution may be less desirable than some others. It may be that a solution of formalin will "fill the bill"; we incline to think it may, but we trust that Dr. Hand's suggestion may lead up to a mitigation of the scholastic penalties that are visited upon diphtheritic pupils in almost all of our cities.—*Cleveland Med. Jour.*

Free Medical Assistance in France.—We note in the official reports that France, with a population of thirty-eight millions and a half, has nearly a million and a half of indigent persons, of whom 375,000 are inscribed as sick. The country physicians are paid to attend them and the total thus disbursed in 1895, the first year the scheme was practically in operation, amounted to 1,771,472 francs. Each one of the 12,000 practitioners received, on an average, about 150 francs. The average to each physician is thirty patients, with three or four visits to each, at about thirty cents (a franc and a half) for each visit. The *Gazette Méd. de Paris* observes that there are a number of departments in which this service is not yet fully organized, and there are many districts too poor to meet the expense, others in which the remuneration is much below the average, "but on the whole, the philanthropists who have conceived and carried this law into execution have accomplished an excellent work, from the social point of view, if not from the medical." The total expense includes hospital and midwife service, transportation, instruments and medicines, and amounted to 4,808,680 francs. This expense was shared by the community, the department and the State, respectively: 3,600,902; 1,104,710 and 305,196 francs. The first article of the law states in effect: "Every sick French person without resources receives, free of charge, from the community, the department or the State, medical care at home or in a hospital. Lying-in women are included in these provisions. Sick foreigners without resources are also included if the government has entered into a treaty of reciprocal assistance with the nation to which they belong."

Good Sanitary Results at Santiago de Cuba.—General Leonard Wood, M.D., as military governor of Santiago de Cuba is almost working miracles with the dirty old town. Along with a committee of surgeons he has made a house-to-house visitation, and enforced a general cleaning up of houses and other buildings as well as of streets and public places. At the time of American occupation the deaths in Santiago numbered 103 a day, but after three weeks of General Wood's rule they had

n reduced to 37 a day. Our editorial prediction of the salu- y results that would follow General Wood's appointment as itary governor of Santiago have been verified. In this rela- the *Medical Record* says that under General Wood's sys- Santiago is divided into five sections, each one under the neral supervision of a medical man, who has under him in- ectors of sewers, streets, houses and dispensaries, and a num- of street cleaners. Five hundred cubic yards of refuse are rned daily, disinfectants are distributed wherever they are eded, and a heavy fine is imposed for uncleanliness or for y failure to report unhealthful conditions and deaths. The ults are shown in a decrease in the death-rate within a month om an average of seventy to one of twenty a day. Among e troops the principal diseases are typhoid, malarial and yel- fevers and dysentery, The cases of yellow fever, several which have been among the so-called immunes, are few in mber and the disease is of a very mild type. The mortality om malaria or dysentery is much greater than that from yel- w fever. Now that the Spanish troops have all left for ain, it is hoped that yellow fever can be made still less dan- rous through the continuance of Dr. Leonard Wood's good ork.

Scarlet Fever of Swine and Kine.—In the *Centralblatt für cteriologie*, Dr. Behle of Frankfort has a paper on the above bject. It has for several years been, in England and Ger- any at least, fairly well proven that kine are susceptible to carlet fever, though in a modified form, dependent on histo- gic and other difference, transmitting it again to man, in hom it resumes its normal characteristics. The disease of wine, known as *rothlauf* in Germany, and as *rouget* in France, in England popularly called "pig's scarlatina," on account f the red erythematous eruption on the skin, but the absence renal phenomena, and the fact that lesions of the intestines re an essential feature, would suggest a nearer relation to nteric fever. But Behle reports a remarkable outbreak of hat appears to have been the true human scarlet fever in wine. He states that in a district where *rothlauf* had never been known, a severe epidemic of scarlet fever among the hildren was followed or accompanied by a very fatal disease mong the pigs at the same farmhouses and cottages. The ymptoms included erythema, angina, albuminuria, and those f uremic poisoning, which (or the angina) were the usual auses of death, while in such as recovered desquamation of he skin was well marked. The lesions in the kidneys, observed fter death, were very characteristic. A previously healthy ig having been inoculated with the blood of a child suffering rom a severe attack, died after a week's illness with symptoms nd postmortem appearances which were identical with those een in the human subject and in the animals which had con- tracted the disease presumably from the children or from one nother. If thefacts be correctly reported, the conclusion that wine are susceptible to true scarlet fever is irresistible.

Vaccination Laws of Pennsylvania.—Dr. Benjamin Lee, in *Pub- lic Health*, September, speaks favorably of the situation, in his State, as to the prevention of smallpox. The existing enactments are not up to the ideals of an experienced sanitist, but they accomplish great good. He says to his colleagues in health work: "We shall make a great mistake if we attempt to interfere with the law. I believe that with persistence in enforcing it our people will become educated to it and the dif- ficulties will vanish." The phase "successful vaccination" is the stumbling-block, and I believe that every local board has the right to interpret that phrase and give the decision accord- ing to its judgment. The decision of the State Board of Health, by resolution, is to the effect that "successful vacci- nation" means vaccination proven by the characteristic mark of vaccination on the skin, that nothing else would be proof of successful vaccination. It is unquestionably true that the school board must accept the physician's certificate, and if the physician is willing to perjure himself I do not see what the board of health is to do except to proceed against the physi- cian. The physician is the one who is putting himself in a false position. Now comes the question, is it worth while to prosecute physicians who undertake to avoid the law in that way? My belief is that the proportion of such physicians is so small that it would be a mistake to attempt it. We do not want to start any agitation in the community which would lead to another attempt such as was made during the past session of the Legislature, when an attempt was made to defeat the vaccination clause of the law of 1895, but fortunately the law stands as before. You can scarcely imagine how strong the appeal was. Petitions came from all parts of the State through the efforts of the Anti-Vaccination Society, and we do not want to give them any such chance again. If boroughs and cities will enforce the law correctly there will be no trouble.

Advantages of London in the Study of Smallpox and other Contagious Diseases.—At the present time five of the admirable hospitals of the London authorities, the Eastern at Homerton, the Western at Fulham, the South-Eastern at Deptford, the South-Western at Stockwell, and the North-Western at Hampstead, are open to students and medical practitioners, while instruction in smallpox is also afforded at the smallpox ships in the Long Reach, near Dartford. A student desirous of taking a course at one of the hospitals must have completed his third year and have held the offices of clinical clerk and dresser; he must then obtain the sanction of the medical school to which he belongs and pay a fee of three guineas for the first three months, and one guinea for each subsequent month, to the clerk of the board, from whom he receives a card indicating the hospital to which he is to be attached. At this hospital he must attend at stated times for at least two days in the week for a minimum period of two months, and on the completion of his attendance he receives a certificate from the medical superintendent whose lectures and classes he has attended. While in the hospital the student places himself under the the control of the medical superintendent, and is bound to observe the regulations in force for the prevention of spread of infection. These rules comprise the wearing, while within the hospital wards, of brown holland overalls, consisting of coat, trousers, and cap, which are provided by the board, and the use of what may be termed a discharge block, which consists of an infected room where the overalls are left, a lavatory, and a theoretically uninfected room. The students are further required to keep their hair short and to be efficiently protected affainst smallpox. A duly qualified medical practitioner has equally to conform to these regulations and must obtain the consent of the medical superintendent of the hospital at which he elects to attend. The student who attends these courses will obtain a fair knowledge of infectious disease, which will stand him in good stead in years to come, while he will also get an insight into the management of fever hospitals and the methods of disinfection practiced therein. The provisions with regard to instruction in smallpox differ somewhat from the above, as it is necessary for the student to reside for two weeks or upward on the smallpox ships, where he is provided with rations, apartments, and washing at an extremely moderate sum. The student has to travel to and from the hospital ships on the ambulance steamer and to furnish himself with a suit of clothes to which he does not attach much value, in order that it may be disinfected or destroyed at the termination of the period.

Another So-Called "Water Famine" in London.—The situation in the district supplied by the companies that deliver water to the northeast of London, has not altered for the better during the latter part of August and the early part of September, for the heavens still refuse rain. That it has not altered materially

for the worse and that the public health remains fair must be looked upon as a piece of good fortune for the company, commensurate at least with the bad fortune which they are experiencing in running short of water during a drought. For if an epidemic of any kind should break out in northeast London the medical men would have hard work to keep the mischief under when deprived of the most natural and efficacious remedy against zymotic diseases, water. Proceedings are now being taken to place the mains of the company in communication direct or indirect with those of the other companies, and when this has been done all fear of an absolute water famine will be at an end. But with the tiding over of the temporary difficulty we hope that the occurrence of these annual breakdowns will not pass from the recollection of the people of London. They ought not to occur, and if the company can not prevent them the company would appear to be unable to carry on its business. There is an alternative. It may be said that the company can manage its works at least as well as any municipal or central body would be able to manage them, but that if there is no water it can not be supplied. In this way the relations during the last two or three summers of the East London Waterworks Company with their clients form a strong argument for the augmentation or alteration of the present source of the metropolitan water-supply. It is said that in East London two million people now have their water-supply only four hours a day at the most. "We do not wish to inspire alarm, but if the present abnormal condition of meteorologic things continues, the consequences may be most serious. The rivers are depleted to the utmost. The drains are not adequately flushed and there is little flow in the upper reaches of the city to carry off the daily discharge of sewage," says the *Lancet*, and points out the necessity, if disaster is to be warded off in the future, of seeking new and adequate sources of water-supply. It argues that this supply must come from Wales. As an illustration of its argument the *Lancet* mentions Loch Katrine in Scotland, which is now lower than it has been in seventeen years. The depreciation in its water level is now about ten inches, and yet it is still an unfailing source of supply for Glasgow. "It is a similar source of supply," says the *Lancet*, "to which, in view of the present conditions, London must turn, though not so favorably situated as Glasgow in this respect. There is, however, the wonderful and inexhaustible watershed of Wales to which we may turn."

BOOK NOTICES.

Manual of the New York County Medical Association. Cloth. Pp. 60. New York: Geo. L. Goodman & Co., 1898.

This, the 1898 edition of the "Manual," contains the revised by-laws as adopted May 16, 1898, and the "Code of Ethics" of the AMERICAN MEDICAL ASSOCIATION, with list of members.

Michigan a Summer- and Health-Resort State. By ROBERTS P. HUDSON. Paper. Illustrated. Pp. 142. Lansing: 1898. Robert Smith Printing Co., State Printers.

This volume was compiled under the direction of the Michigan State Board of Health and "issued in compliance with a concurrent resolution of the legislature." It is gotten up on excellent paper, and contains many excellent illustrations of Michigan resorts, etc., in colors.

Bulletin of the Harvard Medical Alumni Association. No. 12. Paper. Pp. 64. Boston: Published by the Association, 1898.

The "Bulletin" contains a report of the eighth annual meeting, held in Boston, June 28, 1898; officers of the association; constitution; address by the president; report of the committee on the medical school, etc. It is on excellent paper and the presswork likewise excellent.

Transactions of the Michigan State Medical Society. Vol. xxii. Cloth. Illustrated, pp. 452. Published by the Society, 1898.

These "Transactions" are for the thirty-third annual meeting at Detroit, May 5 and 6, 1898. The papers presented the session and included in the volume are grouped under heads of: "Septic Diseases of the Abdomen and Pelvis," "Obstetrics and Gynecology," "General Medicine," "Surgery and Ophthalmology." Under the first heading are papers on "Etiology," "The Blood," "Septic Infection of the Peritoneal Cavity, its Diagnosis and Treatment from a Medical Standpoint." "The Medical Treatment of Septic Peritonitis," "The Treatment of Septic Diseases of the Pelvis," "The Haughton Suture." Other papers are: "Bottini's Operation," "Nephrectomy," "May a Rapid Pulse in Appendicitis Contraindicate Operation?" "Reflections on the Treatment of Appendicitis," "The Frequency, Causes and Prevention of Post-operative Ventral Hernia," "Transillumination of the Stomach with Demonstration on the Person," "The Post Tonsils," "Practical Value of Diagnosis of Presentation by Instrumental Delivery," "Some Anomalies of the Kidneys," "Kraurasis Vulvæ," "Physical Training an Essential Factor in the Radical Curative Treatment of the Pelvic Disorders of Women," etc.

Transactions of the South Carolina Medical Association. Paper. Pp. 262. Charleston. 1898.

The forty-eighth annual meeting of the society was held at Harris Lithia Springs, April 13 and 14, 1898, and the papers presented at that session are included in this volume. The following reports contain much of value: On Obstetrics, on Ophthalmology, on Laryngology and Otology, and on Practice of Medicine. The papers number twenty-three. The are also various reports of committees, list of presidents and meeting places for the last decade, officers for 1898-99, besides the minutes of the annual session and memorial notices of Drs. Charles Rhett Taber, Oliver Miller Doyle, William Joseph Garner, Alex. N. Talley, Thos. Jefferson McKie and Cornelius Kollock.

Transactions of the Maine Medical Association. 1898. Vol. xiii. Part 1. Paper. Pp. 240. Portland. 1898.

This volume of transactions covers the fifty-sixth annual meeting held in Portland, June 1-3, 1898. The following papers are included in the volume: President's Address; "Iatro-Theurgic Symbolism"; "The Local Treatment of Sinuses of the Extremities"; "Accident as a Cause of Appendicitis"; "Cæsarian Section on Account of Cyst of Ovary"; "Tuberculous Bone Disease"; "Talipes Equino-Varus, with Report of a Case Successfully Treated by Cuneiform Osteotomy"; "The Treatment of Uterine Displacement"; "Myxedema as a Form of Anemia"; "Treatment of Diabetes Mellitus"; "Management of Epidemics of Diphtheria in Isolated Communities"; "Notes on a First Series of Ten Thousand Eye Patients in Private Practice"; "Relation of Medical Experts to the Courts and to Each Other"; "Necessity of Additional Hospital Accommodations for the Insane"; "Unusual Sized Rhinolith Removed with the Lithotrite, etc."; "Anastomosis of Gall-Bladder with Large Intestine by Means of the Murphy Button"; "Case of Cerebro-Spinal Meningitis, with Extraordinary Range of Temperature."

PAMPHLETS RECEIVED.

Abscess of the Septum Narium. By W. E. Casselberry, Chicago. Reprinted from Jour. Amer. Med. Ass'n.

Acute Chloral Dementia Simulating Paretic Dementia; the Value of Surgery in Nervous Diseases. By Henry Waldo Coe, Portland, Ore. Reprints.

Advances in the Domain of Preventive Medicine. By F. M. G. Carter, Waukegan, Ill. Paper. Pp. 13.

Advantage of Physical Education as a Preventive of Disease. By Charles Denison, Denver, Colo. Reprinted from the Bul. Am. Acad. of Med.

Beneficial Effects of the Withdrawal of Bromids in Treatment of Epilepsy; Case of Amaurotic Family Idiocy with Autopsy; New Paths in Psychiatry; Vibratory Therapeutics. By Frederick Peterson, New York. Reprints.

Contagion and Infection with Reference to Yellow Fever. By C. Faget, New Orleans, La. Reprinted from N. O. Med. and Surg. Jour.

Contribution to Surgery of Gastroptosis and Enteroptosis; Preparation of Patient for Operation. By Byron B. Davis, Omaha, Neb. Reprints.

Contributions to Orthopedic Surgery. By James W. Cokenower, Des Moines, Iowa. Paper. Pp. 21. Illustrated.

First Annual Meeting of the Medical Society of the State of Wyoming. Paper. Pp. 19. Portland, Ore.: Medical Sentinel. 1898.
Fracture of Femur and Its Treatment. By W. A. Kuflewski, Chicago. Reprinted from Chicago Clinic.
Glaucoma with Detachment of Retina; Orthoform and Extract Suprarenal Glands. By W. Cheatham, Louisville, Ky. Reprints.
Hemorrhagic Glaucoma—Report of a Case with Micro-photographs; Report on Use of Argonin in Gonorrheal Ophthalmia; Acute Inflammation of the Middle Ear; A Case of Tenonitis; The Determining Cause of the Site of Ulcers on the Nasal Septum. By E. C. Ellett, Memphis, Tenn. Reprints.
Kalatonia. By Frederick Peterson, New York, and Charles H. Langmuir, Poughkeepsie, N. Y. Reprinted from Proc. Am. Medico-Psycholog. Ass'n, 1897.
Pathogenesis of the Nasal Reflex Neuroses. By Walter A. Wells, Washington, D. C. Reprinted from Phila. Med. Jour.
Principal Poisonous Plants of the U. S. By V. K. Chesnut. Bulletin No. 20, U. S. Dep't of Agri., Division of Botany. Paper. Illustrated. Pp. 60. Washington, D. C.: Government Printing Office. 1898.
Report of Case of Acute Glaucoma Complicated by Cataractous Formation of Lens, etc. By S. Potts Eagleton, Ocala, Fla. Reprinted from N. Y. Jour. of Med. and Surg.
Report on the Care and Prevention of Rinderpest. By Geo. Turner and Wilhelm Kolle. Paper. Pp. 87. Cape of Good Hope Dep't of Agri. Cape Town: Richards and Sons. 1898.
Rheumatic Pharyngitis. By Lewis S. Somers, Philadelphia. Reprinted from Med. News.
Sarcoma of the Medulla Oblongata and Pons. By O. H. Fretz, Quakertown, Pa. Reprinted from Phila. Polyclinic.
Second Hospital for the Insane of the State of Maryland. By Geo. H. Preston, Sykesville, Md. Reprinted from the Am. Jour. of Insanity.
Sectarianism in the Medical Profession. By G. W. Brooke, Ellsworth, Ohio. Reprinted from Cleveland Jour. of Med.
Semi-Annual Report of Loomis Sanitarium for Consumptives. By Edward Stubbert, Liberty, N. Y. Reprinted from Phila. Med. Jour.
Some Remarks Concerning Rectal Affections, with Especial Reference to the Physical Exploration of the Rectum. By Lewis H. Adler, Jr., Philadelphia. Reprinted from Therapeutic Gaz.
Treatment of Chronic Naso-Pharyngitis. By Lewis S. Somers, Philadelphia. Reprinted from Memphis Lancet.

TRADE PAMPHLETS.

Caroid. American Ferment Co., Jersey City, N. J.
Catalogue of Edison Batteries. Edison Mfg. Co., New York City.
Cremation, Disinfection, Sterilization. W. F. Morse, New York City.
Kryofine. C. Bischoff & Co., New York City.
Medical Department, College of P. and S. of San Francisco, Cal.
Report of Kensington Hospital for Women, 1896-97. Paper. Illustrated. Pp. 36. Philadelphia.
Steubenville Sanitarium, Hornellsville, N. Y.
University Medical College, Kansas City, Mo. Announcement, 1898-99.

SOCIETY NEWS.

Wyoming Medical Society.—The next meeting of the State Society will be held at Rock Springs, Wyo., Nov. 1, 1898.

The Erie Railroad Surgeons' Association. This association will hold its annual session at the Grand Pacific Hotel, Chicago, Oct. 19 21, 1898. W. W. Appley, M.D., Cochecton, N. Y., is secretary and treasurer of the association.

Railroad Surgeons' Meeting.—The Association of Surgeons to the Pennsylvania Company West of Pittsburg will hold its annual meeting in Cleveland, Ohio, October 11. E. C. Brush of Zanesville, Ohio, is President and G. B. Stemen of Ft. Wayne, Ind., secretary.

New York State Medical Association.—The Committee of Arrangements has secured a reduction in railroad fare from the Trunk Line Association, of one and one third fares for the round trip, to members of the association and their families visiting New York at the time of the meeting, October 18, 19 and 20, provided that 100 persons who pay full first-class fare of 75 cents, or upward, coming to the meeting, avail themselves of this privilege. To make this reduction effective, certificates must be obtained from the ticket agent at the starting point, or nearest station issuing through tickets to place of meeting. This certificate, to be valid for the reduction on the return fare, must be endorsed by the chairman of the Committee of Arrangements, and *vised* by a special agent of the Trunk Line Association, who will be present at the place of meeting for that purpose on October 19 and 20. The committee has also completed arrangements for a banquet at the Manhattan Hotel, Madison Avenue and Forty second Street, which will take place on the evening of October 19. F. H. Wiggin, M.D., Chairman Committee of Arrangements.

Wayne County Medical Society.—At the regular meeting of this society, September 29, Dr. D. H. O'Donnell read a paper on "The Physical Development of Girls." The Doctor treated the subject from the standpoint of the reformer. He first enumerated the many defects of the body in womankind as it is today, making comparison of the average young woman in our cities with the strong, vigorous, well-developed Venuses of olden time, and laid the blame to such factors as fashion, ambition, giddiness of youth, faults in our schools and colleges, inattention and lack of interest on the parents' part, ignorance of laws of health, depravity of morals in young girls, ill-fitting and useless clothing, fadism, etc. The down-trodden corset came in for its share of the rebuke which the Doctor administered to these evils. He described it as the straight, stiff, well-ribbed coat of mail worn by many women next the body and drawn recklessly close around the stomach and liver. The Doctor described the ideal woman as the companion and equal of man, a creature of beauty, amiability and goodness, fully equal to the duties of maternity without undue pain or discomfort—the domestic goddess at once a Venus and a Hebe. The avenue to this lay through the efforts of the physician in his advice to the parents, giving them the most enlightning rules for the proper physical development of their girls and boys. As heredity plays an important part in a girl's career, both her father and mother should be healthy and well developed; they should have no enervating or corrupting habits or surroundings, and the whole conduct of their lives should be well ordered and temperate. An advance in this direction should be made all along the line by the medical advisers and family physicians. Doctors should set the example by bringing up their own girls and boys with a rigid regard to their moral and physical well-being, and nothing should be neglected to make the standard of true, pure womanhood the brightest and holiest thing on earth.

NECROLOGY.

BENJAMIN M. GRIFFITH, M.D., St. Louis (Mo.) Medical College, 1859, died in Springfield, Ill., where he resided, September 24, aged 67 years. He was a native of Shelby County, Ky., and a well-known sanitarian, having served several years on the Illinois State Board of Health. He was indentified with the AMERICAN MEDICAL ASSOCIATION and many other general medical societies. His was a record of the greatest activity.

GEORGE W. LINDHEIM, M.D., assistant-surgeon of the 8th N. Y. Volunteer Infantry, died at his home in New York City, September 16, of typhoid fever. He was in charge of a hospital train which brought sick soldiers of his regiment from Chickamauga none of whom save Dr. Lindheim himself have died up to the date of his funeral.

DIETRICH NASSE, M.D., of Bergman's clinic at the Berlin University lost his life in the Alps by the giving away of a snow-bridge, during the week ending September 17.

JOHN F. ISOM, M.D., Western Reserve University, Cleveland, Ohio, 1877, and a resident of that city, died of cardiac disease, September 26, aged 67 years.

WINTHROP B. HALLOCK, M.D., Long Island Hospital College 1864, of Cromwell, Ct., died from apoplexy in a New York hotel, September 24, aged 65 years. He left a wife and two children.

JOHN W. DETWILLER, M.D., University of Pennsylvania, 1873, died at Newport, R. I., September 26, aged 47 years. Until about two years ago he resided in Bethlehem, Pa., and had been located in Newport only a few months. His death was due to appendicitis, a week after operation.

GIOVANNI TROJANA, M.D., an assistant medical inspector of the Board of Health, Philadelphia, died September 26, aged 35 years. Dr. Trojana was graduated from the University of Naples, Italy, in 1881.

F. A. TODD, M.D., Toledo, Ohio, assistant superintendent of the Ohio State Hospital for Insane, died at the Presbyterian

Hospital, Chicago, September 30, the result of a bite from a rabid dog. He was 33 years of age.

C. D. MANNING, M.D., Chicago, Rush Medical College, 1870, was killed while riding on a street-car, September 24, in collision with a wagon. Dr. Manning was born in Dixon, Ill., in 1848.

W. E. FOWLKES, M.D., Owensboro, Ky., a graduate of the Louisville Medical College and also of Bellevue Hospital College, died at his home September 25, aged 50 years.

J. V. HARMON, M.D., Secretary of the Trumbull County Medical Society, died at his home in Warren, Ohio, September 18.

M. A. BACON, M.D., Salem, Wis., September 24, aged 54 years.——Judson Brooking, M.D., Athos, Va., September 20.——John R. Chappell, M.D., Petersburg, Va., September 26, aged 70 years——Thomas R. Clement, M.D., Osterville, Mass., September 24, aged 75 years.——Julius W. Cox, M.D., Mapleton, Iowa, September 8, while on a hunting trip in Idaho.——J. A. Douglass, M.D., Center Star, Ala., September 22.——W. P. Griffiths, M.D., Townanda, Pa., September 21, of rheumatism of the heart.——B. N. Herring, M.D., Decatur, Ga., formerly of Clarksville, Tenn., September 19, aged 76 years.——Thomas Snodgrass, M.D., Crossville, Tenn., September 22, aged 76 years.——W. H. Sykes, M.D., Plymouth, Ohio, September 20.

MISCELLANY.

Personal.—Dr. J. C. Minor, late surgeon, U. S. V., has resumed practice at Hot Springs, Ark.

Correction.—In the JOURNAL for September 10, page 605, column one, in the title of Professor Landenzy's article, read "serum and toxin" for "serumated toxin"; in column two, line 56, read "beef serum" for "beer serum."

Closing the Drug Stores on Sunday.—The druggists of Bordeaux, France, have entered into an agreement to close all drug stores Sunday at noon, with the exception of one in each district. The closed stores indicate the address of the one still open and the papers are also asked to give the address, without mentioning the proprietor's name. The drug stores are to remain open in turn.—*Bull. de la Soc. de Pharm. de Bordeaux*, August.

Tests for Standardizing Toxins.—It is announced from Behring's Experimental Institute that animals react much more sensitively to intracerebral than to subcutaneous or intraperitoneal injections, and hence tests made with fluids introduced directly into the brain are much more delicate and reliable. Guinea pigs will die from $\frac{1}{80}$ of the usual fatal dose, and a tuberculous animal from $\frac{1}{500}$ or $\frac{1}{1000}$.—*Deutsche Med. Woch.*, September 15.

Malaria Perniciosa Tetanica.—A Russian exchange reports a case: Patient unconscious; rectal temperature 37.5 degrees C.; reactionless dilated pupils; jaws clenched; muscle mass, like a board, and every group of muscles except those of the back and respiration in tonic contraction; spleen enlarged, heart and lungs normal. As the patient came from Batum, where malarial infection is known to produce the strangest manifestations, he was treated with subcutaneous injections of quin. bimuriat, carbamidat. 2.0 in aq. dest. 4.10, which promptly cured him.—*St. Pet. Med. Woch.*, September 4.

Urine of Healthy Children.—Churchill (*Archives of Pediatrics*, September) reports results in detail from an examination of 146 specimens taken from seventy children from 1 day to 12 years old. His records show three points of interest: the small amount of urine, the high percentage of urea, and the high specific gravity, i. e., comparatively concentrated urine, and he raises a query as to whether the results represent a coincidence, or whether Americans do pass less urine in health and the probable later renal trouble from the constant irritation of the kidney.

Duty of Person Bitten by Vicious Dog.—Where a person was bitten by a vicious dog, through the alleged negligence of some other person, from whom the former seeks to recover damages, the court of civil appeals of Texas holds, Trinity & Sabine Railway Company, vs. O'Brien, it became the duty of the person bitten to have taken such care of her wounds as a reasonably prudent person would have employed under like circumstances, and she can recover such damages only as she would have sustained if she had taken such care, and not for increased injury attributable to want thereof. Negligence which allows damages to accumulate, the court continues, is not, like that which helps to cause the injury, a complete bar to recovery. It simply prevents the recovery of damages which proper care would have averted.

A Vegetarian Orphan Asylum.—The late Professor Baron bequeathed to the city of Berlin money to found an orphan asylum, with the conditions that no physician was ever to be appointed on the Board, and vegetarian principles were to be strictly observed. The mayor accepted the bequest, but the city council, which includes Virchow, Fürbringer, Fraenkel, Strassmann, and Renvers, has interfered, and the legacy will probably be declined, as the city authorities are unwilling to accept a bequest which compels them to submit orphan children to the experiment of a vegetarian diet.

Operations for Goiter at Berne.—Kocher's method is described in detail in the *Rev. de Chir.*, No. 4. It never leads to hemorrhage, avoids injuring any nerve, and retains a portion of sound thyroid tissue, while the cosmetic results are fine and the wound heals by primary union without relapses. The 204 operations described include 159 thyroidectomies, 12 enucleations, 19 resections, 16 enucleations and resections, and 2 ligatures of the large thyroid arteries. Kocher only enucleates unilocular goiter cysts, easily shelled out nodules, or large nodules in immovable goiters, while he performs thyroidectomy in all other cases, including those of acute and chronic strumitis, and considers exothyropexy only justified when the operation has to be performed without the necessary instruments. He has obtained good results in morbus Basedowii by ligating the third thyroid artery, followed later by ligature of the fourth.

The Eyesight in the Open Air.—Prof. H. Cohn asserts that examinations of the eyes in-doors is no test of their actual capacity, and that all examinations of the eyes of school children, etc., should be made out-of-doors, as otherwise there can be no true standards. He states that the superior visual acuity of Indians and other savages, is due to the necessity of concentrating their attention on objects on which their food and safety depend, and proves his assertions by statistics—many new and personal—which demonstrate that the out-of-door eyesight of civilized peoples averages as high as that of the uncivilized. He concludes that any one can make his eyesight equal to that of a savage by concentrating his attention sufficiently. He adds a plea for more out-of-door life for children, even at the expense of their studies, and training in closer observation.—*Revue Gen. d'Ophthalmologie*, August 31.

Fibrils in the Nerve-Cell.—Golgi's latest preparations, exhibited before the Societa Med. Chir. of Pavia, showed clearly the delicate fibrillary arrangement and network in the Purkinje cells of the cerebellum and of other groups of ganglion cells of the central nervous system. The fibrils are very distinct toward the periphery of the cell, but grow smaller toward the interior, and after a perceptible enlargement they penetrate into and blend with the innermost strata of the body of the cell. The fibrillary apparatus differs with the age of the animal (cats, rabbits, dogs, horned animals and pigs). In the new-born this fibrillary apparatus is much less complicated, the network much less evident. In the adult animal the fibrils are more delicate, the network more distinct, the nodular enlargements more pronounced and the apparatus as a whole

croaches more upon the body of the cell. Golgi's report hances the interest of Ewing's and Nissl's communications URNAL, pages 131 and 674).—*Gazzetta degli Osp. e delle n.*, August 14.

Cæsarian Operations.—The number of these operations is increasing as asepsis enables the indications to be extended. opold and Haake report 100 in the *Arch. f. Gyn.* (lvi, 1), th 10 deaths, all very difficult and desperate cases. The conrvative Cæsarian operation was performed 71 times, all the ildren taken alive, but two died later from the results of the eration, the Porro 29 times with two dead fetuses. They nsider a conjugata vera less than 6 cm. an absolute indicaon for the Cæsarian operation, and amputate the uterus when e patient is debilitated by a serious disease, when there is ason to suppose it is infected, and when there is complete ertia or insufficient pains. Gonorrheal infection, a malignant mor or ruptured uterus render the conservative operation possible.

Ambulance Legislation.—Every now and then the ambulance rgeon gets his bitter dose of rebuke in the police court or in e newspaper. He is sometimes at fault, but more often he the scape-goat. In New York State, some wiseacre legisla- has had a law enacted that is designed to deprive the mbulance surgeon of all discretionary power in the removal the alleged sick or injured person. The law was passed in 96, but it has not been generally known or enforced. A legal ficer of that city is reported to have said that, in his opinion, ed exists for such legislation and that the act "to insure ompt medical treatment for the sick or injured" is a most neficent one, and should receive the cordial co-operation of our citizens. This law makes it a misdemeanor for any rson in charge of an ambulance, hospital or house or place reception for the sick or injured, which shall be wholly or rtly supported at the public expense, to refuse to answer to call or demand for an ambulance, or to take the person for om the call may be made to the hospital or place of recepn for the sick or injured from which the ambulance came, r examination and treatment by the house authorities of the spital or place of reception. The act applies to the drivers ambulances as well as to the physicians, and the penalty for infringement is a fine not to exceed $500 or imprisonment r not more than one yaar, or both fine and imprisonment. If e act is enforced (it will probably not be) the various city stitutions will have a very arduous duty procuring compet officers to operate their "little wards on wheels."

The Abuse of Alcohol.—Prof. Kräpelin described the results his recent research in regard to the effect of alcohol, at the nual meeting of the German Society against the abuse of cohol. His conclusions explain the peculiar phenomenon ted by Exner in 1773, that when a person under the influce of alcohol is ordered to perform a certain movement, termined beforehand, following a certain external stimulus, thinks that he performs it easily and promptly, while scienc measurement of the time elapsing between the stimulus d the movement proves a considerable delay in the response. äpelin finds: 1, that the perception of impressions received the senses is much retarded by the influence of alcohol; en a small amount, ¼–½ liter beer, will suffice for this; 2, e combination of ideas is much slower; processes of thought e altered; speech becomes more and more prominent; thought spreads out in a level;" 3, the voluntary movements cur much more easily and rapidly. This explains the contraction between the objective record and the subjective impression in Exner's tests; the movement occurred more readily d rapidly, but time had elapsed before the stimulus was perved. Observation in everyday life shows the correctness of ese scientific data. The effect of alcohol on the psyche lasts re than twenty-four hours, often several days. Leixner accused the medical profession of the responsibility for the spread of the use of alcohol, and others observed that there is more adulteration and fraud in the so-called tonics and invigorating alcoholic beverages sold than in any other class of goods. Much amusement was caused by the arraignment of several members of the Congress for having imbibed a few "tenths" of beer with their lunch, which led to a clearer statement of the purpose of the Congress: to combat the *abuse* of alcoholic drinks, although Kräpelin's research has converted him to "total abstinence."—From report in *Deutsche Med. Woch.*, September 15.

Medicine now in Disrepute.—An editorial of the *American Medico-Surgical Bulletin*, Sept. 25, 1898, is justly caustic on certain usages of the times. The reflections upon "the yellow journals and their willing medical tools," are to the point, and the medico-political critic, virtuously indignant for a purpose, shares deservedly in the animadversions. There are many hints of loose charges for the sake of a notice through the daily press and some looks askance at sensation-mongers, but as no remedy is proposed, the profession at large must take its chances of survival. "Before the present war," says the writer, "the newspapers were filled with glowing reports of the wonderful things medical science is capable of doing. Exaggerated accounts of our prowess were copied from journal to journal and the hospital surgeons and dispensary doctors were eulogized in glowing headlines, surmounted by their photographs. . . . Now we are all in for condemnation, whether we had anything to do with the army or were mere stay-at-homes." *Sic transit gloria mundi.*

Can Exhibit Actual Condition.—Although it pronounces it an irregularity, the supreme court of Wisconsin holds, in the recent personal injury case of Selleck vs. the City of Janesville, that it was not reversible error for the judge and jury, the latter in charge of the sheriff, to go to the plaintiff's house, a distance of more than fifteen miles from the county seat, so that the plaintiff, who was carried into their presence upon a lounge and was administered to by her physician, could be sworn and testify as a witness in her own behalf. Following this up, the supreme court says that it perceives no error in allowing the plaintiff to exhibit her actual condition to the jury, nor in allowing her daughter to weep. It also holds that the following charge is supported by authority as well as reason: "The plaintiff is not held responsible for the errors or mistakes of a physician or surgeon in treating an injury received by a defect in the street or sidewalk, providing she exercises ordinary care in procuring the services of such physician. Where one is injured by the negligence of another, or by negligence of a town or city, if her damages have not been increased by her own snbsequent want of ordinary care she will be entitled to recover in consequence of wrong done, and the full extent of damage, although the physician that she employed omitted to employ the remedies most approved in similar cases, and by reason thereof the damage of the injured party was not diminished as much as it otherwise should have been." The wrongdoer, the supreme court says, may well anticipate that the person injured will employ a physician or surgeon, and in doing so will exercise ordinary care in making the selection; but, where that is done, such person can not be expected to assume the responsibility of the very highest degree of skill. Indeed, it calls attention to the fact that it has gone so far as to hold that where personal injuries result proximately from negligence or other tort, the wrongdoer is liable for the damages actually sustained, although they are increased by a tendency to disease on the part of the person injured.

Effect of Altitude on Anemia.—According to the *British Medical Journal*, Paul Bert, as early as 1882, called attention to the fact that the blood of an animal on a mountain absorbs more oxygen than under lower conditions. Mercier and others have

found that while counting the corpuscles of men and rabbits returned from the mountains to the plains, the daily decrease ceased on the thermometer falling 13 mm., and in two rabbits there was even an increase of corpuscles. Whether on a mountain or under a bell jar, the most noticeable alteration in the blood is an increase of the red corpuscles, which appears earlier and is more rapid than the increase of hemoglobin. Egger has had the same results in man at an elevation of 1890 meters; the average increase of red corpuscles after fifteen days was 16 per cent. Mercier confirms this. Those observers (Loewy and Kohlbrugge) who have failed to note this property of mountain air were not careful to exclude vitiating conditions from their experiments. All the most reliable evidence goes to show that the increase of red corpuscles is real, and has nothing to do with a supposed concentration of the serum through evaporation. Viault and others have remarked the great number of small discs in blood received on elevated places, which are probably developing erthrocytes. This explains the fact that hemoglobin does not increase so rapidly as the corpuscles, since the young globules do not contain their full amount. Finally, Schauman and Rosenquist have observed nucleated red corpuscles in the blood of dogs and rabbits living for some weeks under a bell jar under a depression of 45 to 48 cm. of mercury. Suter and Jaquet found that in rabbits which had lived at Davor for four weeks not only was their blood one sixth richer in hemoglobin than that of those left behind at Basle, but the quantity was more per kilogram of body weight (about one-tenth). The mechanism of the increase of red corpuscles is still not properly understood. It is certain that in healthy persons the increase is not permanent, but disappears on a return to the plains as rapidly as it came. However, the most important fact is that anemi people retain more red corpuscles than they had before their mountain sojourn for long after their return.

Creasote in Gastric Affections.—According to Zanger of Zurich, in a paper on creasote, contributed to the *Correspondenzblatt für Schweizerische Aerzte*, the present tendency to think that the larger the dose of this drug the better in phthisical cases, is by no means justified by experience, for the best results are often obtained with very small doses indeed. He believes that their beneficial effect is due to their action on the stomach, causing it to do its work better, and so to improve the nourishment of the system. He finds that in many cases of purely gastric affections, with or without diarrhea, or other intestinal symptoms, minute doses of creasote will often succeed when other remedies have failed. In the gastroenteritis of children and in the vomiting of pregnancy, he has been greatly struck with its effects. The doses he gives vary from $\frac{1}{11}$ gr. in children to $\frac{1}{3}$ gr. in adults. He prescribes it with enough spirit to dissolve it in a spoonful of water, with or without water. Black coffee or mint tea may be employed, if necessary, to disguise the taste. When infantile diarrhea exists, without vomiting, he has often found creasote valuable. In the milder forms of the vomiting of pregnancy small doses of creasote have always produced an improvement, and he thinks that even in severe cases a trial of the same treatment should be made.—*Public Health*, August.

Syphilis and Divorce.—There are two recent decisions on this subject that should be noted. In the case of Smith vs. Smith, the supreme judicial court of Massachusetts holds, that where a wife ascertains, within a short time after the performance of the marriage ceremony, and before the consummation of the marriage, that her husband has syphilis, which has advanced to such a stage as to be probably incurable, whether he acquired it through unchastity or has become constitutionally affected with the disease from his birth, she is entitled, after refusing to consummate the marriage, to have it annulled. Few, if any, says the court, would be bold enough to say that it was her duty, on discovery of the fraud, before c summation of the marriage, to give herself up as a sacri and to become a party to the transmission of such a dis to her posterity. There are reasons why a fraud of this c acter, discovered before the consummation of the marri and at once made a ground for separation, should move court more strongly in favor of the wife than if the disco had come later. And the court takes particular pains to s that it does not intimate that the concealed existence of ereal disease in one of the parties to a marriage will ordina be a sufficient ground for a decree of nullity. In most ca presumably, it significantly remarks, the disease is cura The other decision referred to is one of the supreme cour Pennsylvania, rendered July 21, 1898, in the case of McMa vs. McMahen. Here was a case of a young woman, whose nocence was not at all impeached, having been infected w syphilis by her lover (who subsequently became her husba during the period of his courtship, probably by kissing frequently, and after marriage having been kept constantly a diseased condition from the same source, until she had pas into the secondary condition of the disease, and had proached on the tertiary stage thereof, having endured upward of five years the constant presence of one of the vil most shocking, and dangerous diseases with which the hu body can be afflicted. Is such a person legally bound to main in such relation with her husband during the whole her subsequent life, and has she no redress whatever, in way of divorce? asks the court. But it says that, in its op ion, to state this question is to answer it. It says that it d not see how it is possible to imagine a more direct and pal ble case of cruelty to a wife by her husband than this, a that it comes within, not only the spirit, but the very letter the Pennsylvania statute which allows divorce "when a husband shall have by cruel and barbarous treatment end gered his wife's life, or offered such indignities to her per as to render her condition intolerable and life burdenso and thereby force her to withdraw from his house and fa ily." It is of no consequence, continues this court, that in ulation occurred before marriage. It is the continuation a constant presence of the disease after marriage, making h condition intolerable, and endangering her health and l that entitles her to a divorce.

A Child can not Maintain an Action for Injuries Sustained Before Birth.—The appellate court of Illinois, first district, holds appeal in the case of Allaire vs. the St. Luke's Hospital, M 26, 1898, that the action not being given by any statute, a ch can not maintain one, by the common law, for injuries su tained before its birth. That a child before its birth is, fact, a part of the mother, and is only severed from her birth, can not, the court thinks, be successfully disputed. T doctrine of civil law and the ecclesiastic and admiralty cour that an unborn child may be regarded as in being for some pu poses, when for its benefit, the court pronounces a mere leg fiction, which, so far as it has been able to discover, has n been indulged in by the courts of the common law to the exte of allowing an action by an infant for injuries sustained befo its birth. If the action could be maintained, it would nece sarily follow that an infant might maintain an action agai its own mother for injuries occasioned by the neglect of t mother while pregnant with it. Mr. Justice Windes dissent He argues that if the willful and malicious conduct of a pers causing an injury to an unborn child resulting in its deat after it has been born alive, will fasten on the person the cri of murder or manslaughter, there seems no sound and logic reason, since the crime includes the injury to the child, a since the public offense is also a private and special wrong the helpless infant, why, if the child should be so fortunate to survive the injury, which, had it caused death after bei

alive, would have made the wrong-doer a criminal before law, the child should not have his action at law against same wrong-doer, for damages because of his tort. Could be successfully contended that for an injury to Chang, one the famous Siamese twins, he could not maintain an action use he was a part of his brother Eng—that he was not a arate entity? Could it be contended that in such a case was the person to bring the suit, because the injury to his her Chang was an injury to him, Eng? The judge thinks uite as reasonable to say that the mother can recover for ries to her living, moving child because contained in her ub or lying beside her after its birth, attached by the um-cal cord, as to say that in the case of an injury to one of the nese twins, the other could have brought suit. The child, n capable of being born alive, is, in the judge's opinion, a inct entity, under the common law, and although no dis-t civil case, so far as he knows, has so held, humanity and ghtened civilization, he insists, demand that the common as administered in Illinois in the 19th century should so lare. What will a still higher tribunal say if called on for cision on this point?

ehring's American Patent on Antitoxin.—The *Munich Medi-sche Wochenschrift* of September 6, contains the following torial: "Professor Behring of Marburg has at last, after a mber of ineffectual attempts, succeeded in obtaining a pat-in the United States for the production of diphtheria um. The patenting of a scientific discovery by a physician tradicts to such an extent the cherished traditions of the dical profession that it is not surprising that Professor hring has been assailed with violent criticisms on account of s patent. He replies to these criticisms in the following planatory letter which has appeared in a Marburg paper: is true that a patent has been granted me in America for production of diphtheria serum, and it is true that the erican firms who have hitherto been commercially benefit-g by the production of diphtheria serum are angry about it. hen the Americans interested express their anger in the erican way, that is their own concern; but when in this se, entirely contrary to their usual customs, they declare at to take advantage of existing laws to exploit an important ctical discovery, is immoral and scandalous, I can not cept their verdict seriously. For my part, I do not consider legitimate means of making money dishonorable; I might en go so far as to say that I consider the renunciation of a nsiderable pecuniary profit, legitimately one's own, unpar-nable folly. Time will show whether the American courts ll be coerced by this newspaper clamor into interfering. this, as I confidently anticipate, does not occur, then the erican public will derive much benefit from the patent, as ey will then secure the diphtheria serum better and cheaper. e denial of my right of invention and discovery is based on norance and injustice. Ask any one of the scientists whose mes are mentioned as having co-operated with me in the scovery of diphtheria serum; not one of them will wish to ntest the priority with me.' This explanation can only ouse the most painful sentiments in medical readers. The st statement is correct. To Behring alone belongs the honor the glorious discovery of diphtheria serum. But the grati-de which the world, and especially the medical profession, e him for this discovery should not induce us to accept in lence such principles as are enounced in the foregoing expla-ation. It is not true that every way of making money which oes not conflict with the laws, is honorable for the physician. would be the severest blow to the prestige of the medical rofession if these principles, which sound like a sneer at the forts of physicians to raise themselves above the level of e trades, should be accepted. As far as the patenting of a emedy is concerned, the German patent laws do not allow it; ven the diphtheria serum is not protected in Germany. This estriction does not seem to exist in America, although the Code of Medical Ethics, endorsed by the better American physicians, declares that it is 'derogatory to professional character to hold a patent for any surgical instrument or medicine . . . inconsistent with beneficence and professional liberality.' The American, as well as the English professional press, regard Behring's application for a patent as a breach of the ethical foundations of the medical profession, and criticise it in the severest terms, which we must regret all the more as we can not consider them unjustified."

Behring disclaims that he is still a physician. In a letter to the *Deutsche Med. Woch.* of September 15 he remarks: "I gave up my professional practice when I entered upon my career as an experimenter and inventor, and I am compelled to seek means in a commercial way to carry on my experimental-therapeutic work."

Nerve Fatigue of School Children.—Dr. R. C. Scheidt, of the Franklin and Marshall College, presented a voluminous address (*Public Health*, July) on the hygiene of school-attendance, before the fifth annual meeting of the Associated Sanitary Authorities of Pennsylvania (*vide* JOURNAL June 18, 1898, p. 1469), in which he urged an ampler protection of the health of the overworked children of the public schools. He argues against the afternoon session as being unnecessary confinement, if the pupils have a long and properly arranged morning session. The following are some of his conclusions: 1. I am convinced that the esthesiometer is the proper instrument for the measurement of fatigue. 2. My tentative experiments with American boys prove a superior normal strength of their mental vigor under favorable conditions of the atmosphere. 3. Unfavorable conditions of the atmosphere show an unusually large percentage of abnormal fatigue of the nervous system. 4. I attribute this condition to the utter lack of systematic open-air exercises. 5. I advocate such exercises for children as a prime necessity, because the foundations of a healthy and useful life are laid between the seventh and fifteenth years, but never afterward. 6. Training of all the functions of the physical organism should precede instruction, because it will develop the necessary mental strength. 7. Children should be classified according to their individual characteristics, and stress should be laid upon the development of their weakest organs, in such a way, however, as to leave plenty of room for individualization. 8. Such exercise should take place every afternoon, and should be continued until the limit of normal fatigue is reached. 9. The exercises should be grouped into muscular, cutaneous and respiratory. 10. All these exercises should be essentially exercises of the nervous system, to lead to a proper development of character. The writer holds that it is not learning, primarily, but health and character should be the watchward of our schools; first training, then instruction, the sequence of a rational educational policy. Pedagogics, as a science, should therefore no longer be based upon philosophy, but upon physiology and hygiene. The chief factor in every school board should be the well-trained physician, and the physician only. His investigations, carried on for a number of years, have led him to the firm conviction that the American boy is the superior of the boy of any other nation on the face of the globe; he is worthy of special considerations because his training will in the end produce the superior man, for only during the years of boyhood, from the seventh to the fourteenth, fifteenth and sixteenth year, can training be made successful; if neglected then it will forever remain neglected. Considering the large number of heterogeneous branches now taught in our public schools, and, at the same time, the intense interest in all sorts of ill-directed physical exercises manifested by both girls and boys, we conclude that the endurance for every specific activity can be but small, while the sum total of all the energies consumed is rather larger than in former ages; however, the mere external exhibition of ability is, in the case of children, not by any means the absolute criterion for the sum total of living forces within the human organism. Let us abolish afternoon instruction. No matter how vigorous the nervous system may be, the brain ought not to be taxed

while in the process of growth, while digestion is going on. Under unfavorable external conditions, abnormal fatigue will prevail throughout the whole afternoon, and in the course of time the brain will become unfit for mental work. Afternoon instruction is therefore absolutely unhygienic. Teachers are unanimous in pronouncing afternoon mental work a failure in the majority of cases. One long morning session, with a number of recesses, ought to suffice. Let that instruction be rational, let it largely be object-teaching; do not overfeed children with grammar, which presupposes mastery of speech and the power of developed thought. The brain-cells required for such work are as yet but imperfectly developed, and the natural result is a mechanical memorizing resembling the training of a parrot. How different the effect of the introduction of the various mechanical arts. They appeal at once to the various organs of sense, and through them to the intellect. Large playgrounds should be provided in every city, and every school house should be joined by a large roof-covered area, equipped with the most important apparatus necessary for physical training, for both summer and winter. The authorities ought to see to it as much as possible that each child is given the opportunity to develop its individual inclinations, for in the nature of the case, and necessarily so, class-room work has a levelling tendency, its laws are those of a liberal sometimes even of an illiberal, despotism; a child becomes one of a dozen, and nothing more, and the only virtue practiced is that of obedience, which it should have acquired at home. On the play-ground the development of individuality ought to be given a chance, but always under the control of the wiser parent or teacher.

Detroit.

HEALTH REPORT for week ending September 30: Deaths, under 5 years, 36; births, male 33, female 32; diphtheria, 5 cases, 12 new cases, 4 recovered, 1 dead, 12 sick now; scarlet fever, 4 cases, 7 new cases, no recoveries, no deaths, 11 sick now; smallpox, 2 sick, 5 new cases, no recoveries, 7 sick now.

Cincinnati.

DR. P. S. CONNER, of this city, has been appointed to the commission for the investigation of the war department. Dr. Conner was born in West Chester, Pa., in 1839, served with distinction as an assistant-surgeon in the War of the Rebellion, but did not retire from service until 1866. Since leaving the Army he has practiced in Cincinnati. He has been president of the American Surgical Association, the Ohio State Society, the Cincinnati Academy of Medicine, is Professor of Surgery in the Ohio Medical College and in the Dartmouth Medical College, and also surgeon to the Good Samaritan Hospital and, until a few years ago, to the Cincinnati Hospital.

Louisville.

HEALTH OFFICE.—In the forthcoming annual report the Health Officer, Dr. M. K. Allen, will urge the following recommendations: A milk and food inspector; the establishment of public urinals; the establishment of public baths for the use of the poor; the setting apart of a hospital for the care of consumptives; the establishment of a detention ward at the City Hospital for persons suspected of being insane, and for the surgical treatment of patients from the work-house and almshouse; the furnishing of diphtheria antitoxin to the poor by the city; requiring all physicians to report the following diseases to the Health office, not to be placarded: consumption, typhoid fever and whooping-cough, and the placing along the thoroughfares baskets or boxes to be used as receptacles for waste paper, fruit peelings, etc.

BOARD OF PHARMACY.—Governor Bradley has appointed Mr. Addison Dimmit a member of the State Board of Pharmacy, to succeed Dr. J. W. Fowler, whose term had expired. Mr. Dimmit is a member of the firm of Geo. A. Newman & Co., wholesale and retail druggists of this city.

MATHEWS.—Dr. J. M. Mathews has just returned from an extended trip east, having been in attendance upon the American Association of Obstetricians and Gynecologists at its recent meeting in Pittsburg.

MORTALITY REPORT.—The mortality report for the month of September shows a total of 230 deaths against 262 for the same month last year. Consumption caused thirty-eight deaths, typhoid fever eleven, old age thirteen. Only sixty of the deaths were colored people.

GILLETTE.—Miss Nellie Gillette, who for five years has been the efficient Superintendent of the John N. Norton Memorial Infirmary and Training School, has left for her home in New York on a year's leave of absence on account of ill health. She will return at the end of that time to resume her duties. The class of four will graduate this month from the Training School.

Washington.

HEALTH OF THE DISTRICT.—The report of the Health Office for the week ended September 24, shows the total number of deaths to have been 104, of which 52 were white and 52 colored. The principal causes of death were nervous diseases, 12; circulatory, 8; genito-urinary, 5; respiratory, 16; intestinal, 11. There were five deaths from typhoid, 7 from diphtheria and 3 from malaria. There were 79 cases of diphtheria and 57 cases of scarlet fever under treatment at the close of the week. There are no cases of smallpox in the city at present, the last case having been discharged from the isolation hospital on the 15th ult.

HEALTH OFFICER AFTER FREEDMAN'S HOSPITAL.—Health Officer Woodward has called upon the surgeon of the Freedman's Hospital for an explanation of the fact that the contagious disease regulations are being repeatedly violated by that hospital, in not properly caring for and reporting contagious diseases to the Health Office. Dr. Woodward has appealed to the Interior Department in order to secure its co-operation in checking the reported violations. If Congress would abolish the "political-plum-feature" of this hospital and place the control of the institution under the District Commissioners, where it rightly belongs, the existing friction would be promptly removed.

CENTRAL DISPENSARY AND EMERGENCY HOSPITAL.—The annual report of the Central Dispensary and Emergency Hospital for the year ended June 30, 1898, shows the total number of new patients treated was 11,927, making 35,333 visits; of this number 7722 patients were treated in the Dispensary and 4205 in the Emergency Department. There were 2120 operations performed, 308 patients committed to the wards, 579 ambulance calls, 36,196 prescriptions compounded and 41 deaths. Dr. Burnett, the President of the Attending Staff, calls attention to the necessity for more room for the treatment of patients, and notes that there was a slight falling off of new patients in the dispensary during the year, due to the rigid enforcement by the hospital authorities of the rule of the Medical Association, requiring applicants for treatment to present a certificate of dependency before being admitted to the different services. He also calls attention to the munificent gifts of Mrs. Phebe A. Hurst. Last year she presented the hospital with a very valuable X-ray apparatus, and this year she has presented a large plat of ground and house for the nurses of the hospital. The work of the Ladies' Auxiliary Board, in improving the operating rooms of the hospital is highly commended, and the excellent work of the resident physicians specially noted. The superintendent, Miss Simonton, reports that the training school, which has been started in conjunction with the Washington Asylum, the Washington Training School for Nurses and this hospital, is being conducted very satisfactorily, and a large number of pupil nurses have been admitted. The treasurer's report shows the total receipts to have been $17,531.65, and the total expenses to have been $17,528.55, with a balance of $3.10.

PHYSICIAN TO THE POOR APPOINTED.—Dr. James R. Tuban, the faithful substitute physician to the poor, has been pro-

ed to fill the vacancy caused by the resignation of Dr. J. D. dfield, physician to the eighth district.

RMY APPOINTMENTS.—Drs. Edmund Barrie and Samuel N. nnon have been appointed acting assistant-surgeons in the ny. The former leaves to take charge of the Red Cross spital at Camp Mead, the latter goes to Santiago de Cuba special detail.

ISITED WASHINGTON.—Dr. Joseph M. Matthews, President he AMERICAN MEDICAL ASSOCIATION, and Dr. I. N. Love of Louis, made a flying visit to Washington on the 30th ult.

Philadelphia.

NOTHER INFECTED SCHOOLHOUSE.—A serious epidemic eatens the district of Paschalville, where thirteen cases of phtheria have recently occurred, eleven of which can be ced to the John Bartram school. An investigation of the roats of several children who had been ailing for a few days owed the presence of the specific germ. In one instance in ich several children from one family were suffering with phtheria, it was found that there had been no physician in endance, and on further inquiry it was learned that the mily were Christian scientists. It is stated that Dr. Taylor the Bureau of Health detailed a corps of medical inspectors make a thorough investigation of the suspicious cases occurg in the district and report same to the proper authorities, d institute quarantine where necessary. The schoolhouse s been thoroughly cleansed and fumigated.

APPEAL FOR FUNDS.—Owing to the heavy drain necessarily tailed in bringing to this city and caring for a thousand sick ldiers, the National Relief Society of Philadelphia has made urgent public appeal for funds in order to carry on its work. is not all to simply care for the soldiers while they remain in e hospitals, but the heaviest burdens will fall upon the fames of those who have been discharged from the hospitals in attered health and without any permanent employment. It stated that in some instances of this character, a few poor fortunates have actually had to pawn their clothing before nployment was found. Mr. George C. Thomas, treasurer of e National Relief Commission, acknowledges the following ntributions: Cash previously acknowledged, $66,627.32; her contributions and supplies, $40,265. The Red Cross ciety of Philadelphia has been very active in the relief of e sick soldiers, and up to date $14,888.14 has been received, hich will go to those who most need support while seeking r permanent employment. The hospitals of the city also ceive contributions to be expended in this manner, and by e co operation of all channels it is hoped that every unfornate patient brought here may be cared for and his wants tended to.

UNIVERSITY OF PENNSYLVANIA.—Several familiar faces were issed at the opening exercises, and a touching tribute was aid to Dr. William Pepper by Provost Harrison, who recited e wonderful advances made by the University under his direct uidance. The venerable master of surgery, Dr. John Ashurst, was referred to with the heartfelt hope of his early covery. The University begins the session with much greater cilities for teaching, such as new laboratories, etc. The ngthened course has not prevented an increase of numbers ver the period when only a three years' course was required, nd there are now more students enrolled up to the present me than there were last year.

PERSONAL MENTION.—Dr. William White, professor of clinical surgery in the University of Pennsylvania, who has been pending the summer in Europe, has returned home to resume practice and clinical teaching at the University.

Dr. Benjamin Lee, Health Officer of Philadelphia, who has been in attendance at the twenty-sixth annual meeting of the American Public Health Association, has returned. It is reported that at this meeting a resolution was passed favoring the appointment of a committee to secure the co operation of the United States, Canada, Mexico, and as far as possible the countries of Europe, to adopt the Bertillon system for the classification of diseases, on account of the inaccuracies of the other systems now in vogue. Pennsylvania adopted the Bertillon system at the last meeting of the State Board of Health, and it is hoped that its results will prove both convenient and useful.

Surgeon-General W. K. Van Reypen, U. S. N., has recently made a thorough inspection of the naval hospital situated at this point, and pronounces the condition of things eminently satisfactory.

FACULTY CHANGES.—Since the death of Dr. William Pepper professor of the theory and practice of medicine at the University of Pennsylvania, there has been much speculation as to his successor. Nothing was known of the action which the Board of Trustees might take toward choosing his successor, and while the Board recently placed Dr. James Tyson in this coveted chair, it seems that this action is not entirely final, and Dr. Tyson will only be the nominal head of that department, while the didactic lectures will be given by several capable teachers of the faculty. The University has always conformed to the civil service reform by promoting those it has brought up into the places made vacant by the death of one of its members. Dr. Tyson will have full supervision over the branch of general medicine, both didactic and clinical, while Dr. John H. Musser, Dr. Alfred Stengel, Dr. M. Howard Fussell and Dr. Frederick A. Packard will give didactic lectures to members of the graduating class. The names of Dr. Judson Daland and Dr. John K. Mitchell were also mentioned for this honor, but as they both now hold chairs in the teaching faculty, it was thought best not to make any changes in their departments. Owing to the unfortunate illness of Dr. John Ashhurst, his chair remains unfilled and will probably remain so during the coming term. In the meantime, Dr. J. William White will be the nominal head with full supervision over the department, while Dr. H. R. Wharton and Dr. A. C. Wood will give some of the didactic lectures until final action is taken by the Board of Trustees.

AYER LABORATORY.—The foundation of the Ayer Laboratory has been laid and the building is now assuming definite proportions. The building was given to the Pennsylvania Hospital by Mrs. Josephine Ayer of Lowell, Mass., who left a legacy of $50,000 to the hospital for the erection of this building. The material used will be red brick with gray granite, but the style of architecture of the simplest kind, with Doric pilasters and symmetric arrangement of the windows so as to maintain as much as possible the old colonial tastes. The basement will be utilized as a museum, the first floor for autopsies and a mortuary chapel, the second floor for bacteriologic and chemic studies, and the attic for scientific photography. The building will have an endowment of $25,000, so that the work in the different departments will never become embarrassed from the lack of funds.

WOMAN'S MEDICAL COLLEGE.—At the opening session of the Woman's Medical College of Philadelphia, Dr. Gertrude Walker delivered an address dealing with the influences in and around the medical profession, and pointing out to the students the evils to be avoided and urging a high preparatory course before beginning the pursuit of medicine. In the opinion of the speaker, a large proportion of the ills of humanity were due to hysteria, and from this source Christian scientists gained a foothold upon the community. The speaker also warned the students against all forms of quackery and associations of "pathists" of every school. A four years' course has been instituted at this college.

ANOTHER WAIL FROM HOMEOPATHS.—From the recent meeting of the homeopaths of Pennsylvania, recently held in Pittsburg, comes a complaint of the unfair treatment accorded the Hahnemann by the innumerable officials of Philadelphia over

the distribution of soldiers who were brought to the city for treatment, and it was thought the Hahnemann did not have a fair chance to get at them. Dr. Mohr is reported as saying: "When the first train left Philadelphia to bring the sick soldiers from the South, we made application to the Director of Public Safety and other officials in the city, but although we stated that we could care for twenty-five cases, we received only *one*. When the second train left we still gave them the option of sending twenty-five cases, but we received only "one." Fortunately, however, for us as a school and a hospital, we had placed ourselves in communication with the ——— and from his representative in Philadelphia an aggregate of sixty-two soldiers were received."

PRESIDENT OF WISTAR INSTITUTE.—At a recent meeting of the Board of Trustees of the Wistar Institute of Anatomy and Biology, Provost Charles C. Harrison of the University of Pennsylvania was elected president to succeed the late Dr. William Pepper. The Wistar Institute of Anatomy, while its work is not fully comprehended, being for post-graduate students only, will some day take first rank with any institution of its kind in America, for its endowment and large collection of anatomic specimens could hardly be duplicated on this side of the Atlantic. The institution is governed by a board of managers, six of whom are elected by the trustees of the University.

WOMAN'S HEALTH PROTECTIVE ASSOCIATION.—This Association, which has taken such a prominent part in the crusade against the filthy Schuylkill water and is instrumental in bringing about reforms in hygiene among the poorer classes, recently had its first fall meeting. The president, Mrs. John Scribner, delivered an address outlining the work for the coming months, and stated that the principal subjects which would receive attention would be contagious diseases, meat, milk, the schoolhouse question and the "consumptive poor."

SHAIN SCHOLARSHIP.—As a result of a competitive examination held recently, Robert Sawford Scott was awarded the Shain scholarship in the Jefferson Medical College. This scholarship was established from the legacy of Dr. Francis W. Shain, who bequeathed $4000 for this express purpose. The scholarship entitles the recipient to a four years' course in the Jefferson Medical College, and as the examination is a rigid one, makes the honor the greater.

Societies.

The following recent meetings are noted:

Iowa.—Northwestern Medical Association, Sac City, September 21.

Maryland.—Baltimore County Medical Association, Baltimore, September 22.

Michigan.—Kalamazoo Academy of Medicine, September 27.

Missouri.—St. Louis Medical Society of Missouri, October 1; Medical Society of City Hospital Alumni, September 15.

New York.—Medical Society of the County of New York, New York, September 26; Syracuse Academy of Medicine, September 20.

Ohio.—Delaware County Medical Society, Delaware, Oct. 4.

Pennsylvania.—Susquehanna County Medical Society, New Milford, October 4; Venango County Medical Society, Franklin, September 20.

Tennessee.—East Tennessee Medical Society, Newport, September 22.

Texas.—Houston District Medical Association, Sept. 26.

Wisconsin.—Central Wisconsin Medical Society, La Crosse, September 27.

American Public Health Association.—This Association elected the following officers at the recent meeting: President, George H. Rohé of Baltimore; secretary, C. O. Probst of Columbus, Ohio; treasurer, Henry D. Holton of Brattleboro, Vt.; executive committee, Prof. F. C. Robinson of Brunswick, Me., Irving H. Watson of Concord, N. H., Frank W. Wright of New Haven Conn., and others. The Association will meet in Annapolis in November, 1899. An abstract of the proceedings will appear in the JOURNAL, beginning next week.

CHANGE OF ADDRESS.

Adams, S. S., from Mt. Lake Park, Md., to No. 1 Dupont Circle, Washington, D. C.
Butterworth, A., from Chicago View Hotel to Central Music Hall, Chicago.
Braun, O., from Ashland to Merrill, Wis.
Boyer, J. S., from Chicago, Ill., to Marganna, Va.
Butler, W. J., from 670 Grand Av. to 1361 Jackson Boul., Chicago.
Cassidy, W. W., from Wabasha, Minn., to 740 Jackson Boul, Chicago.
Carson, C. J., from Mortimer, Ill., to 204 S. Lincoln St., Chicago.
Danielson, C. A., from Omaha to 720 Jackson Boul., Chicago.
Downey, W. S., from 925 W. 56th to 4501 Wallace St., Chicago.
Evans, E. E., from Sumner to Stephen's Store, Mo.
Felix, T. O., from St. Louis, Mo., to Downs, Kas.
Finley, G. W., from Harmony to Brazil, Ind.
Gallen, G. E., from Calumet, Mich., to 715 W. Harrison St., Chicago.
Honan, J. H., from Rensselaer, Ind., to 78 Lülzow Strasse, Berlin, G.
Hoyt, F. C., from Clarinda, Iowa, to 5337 Madison Av., Chicago.
Jones, Mrs. S. B., from Rahway to 67 Monticello Av., Jersey City, N.
Jones, W. D., from Devil's Lake, N. D., to Rising City, Neb.
Ketchersid, J. N., from Abilene to Hope, Kas.
Lewellen, W. P., from Clarinda to Brookfield, Iowa.
Miller, W., from Thurman to Rio Grande, Ohio.
Musson, E. E., from 1206 Locust to 258 S. 16th St., Philadelphia, Pa.
Pomeroy, H. M., from San Diego to Los Angeles, Cal.
Runkel, W. W., from Johnson's Creek to 2324 Violet St., Milwaukee, W.
Reese, L., from Chestnut Grove to Minerva, Ky.
Smith, F. L., from Sheffield, Mass., to 1130 Bridgeport, Conn.
Sheldon, J. G., from 204 S. Lincoln St. to 656 Jackson Boul., Chicago.
Searles, L. M., from Mt. Ayr, Iowa, to 1025 O St., Lincoln, Neb.
Schmidt, O., from Fond du Lac, Wis., to 202 Lincoln St., Chicago.
Titterington, M. B., from Norwalk, Ohio, to Jerseyville, Ill.
Taylor, J. M., from Bar Harbor, Me., to 1504 Pine St., Philadelphia, P.
Terry, M. C., from Ft. Shaw, Mont., to 628 Adams St., Chicago.
Thompson, G. N., from New Milford, Ill., to Keokuk, Iowa.
Taylor, P. K., from Kingston, R. I., to 211 W. 139th St., New York City.
Wirt, W. E., from 122 Euclid Ave. to 477 Prospect St., Cleveland, O.
Wooding, B. F., from Denver, Colo., to Fortress Monroe, Ohio.
Zimmermann, M. W., from 117 S. 17th to 1522 Locust St., Philadelphia.

LETTERS RECEIVED.

American Therapeutic Co. (2), New York City.
Bailey, W. C., Las Vegas Hot Springs, Mexico; Bascom, H., Ottawa, Ill.; Bailey, Milton, Sheldon, Iowa; Brown, F. F., New York City; Book Keeper Co., Ltd., Detroit, Mich.
Campbell, R. D., Grand Forks, N. D.; Breveling, Geo. B. Philadelphia, Pa.; Comstock, H. C., Sioux City, Iowa; Culbertson, J. C., Cincinnati.
Emanuel, H. W., Milnor, N. D.
Fisher, Lewis, New York City; Fuller's Adv. Agency, C. H., Chicago.
Gardner, R. W., New York City; Gihon, A. L., New York City; Greenleaf, C. R., Washington, D. C.; Greenley, T. B., Meadow Lawn, Ky.
Girard, A. C., Camp George Gordon Meade, Pa.
Hawley, B. C., Burlington, Vt.; Hartshorn, W. E., Minneapolis, Minn.; Henley, G., Ann Arbor, Mich.; Hummel Adv. Agency, A. L., New York City; Hektoen, L., Chicago.
Johnston, C. H., Grand Rapids, Mich.
Kindred, J. Jos., Astoria, L. I., N. Y.; Kempson, J. F., New York City.
McLean, Donald, Ft. Monroe, Va.; McConnell, E. P., Kirksville, Mo.; Minor, J. C., Hot Springs, Ark.
Parker, E. F., Charleston, S. C.; Powell, E. W., Omaha, Neb.; Punton, Jno., Kansas City, Mo.; Potts, Mrs. R. D., San Francisco, Cal.
Reese, Lester, Minerva, Ky.; Riley, W. H., Boulder, Colo.
Stillwell & Co., Melbourne, Australia; Saunders, W. B., Philadelphia, Pa.; Scott & Bowne, New York City; Sothoron, Mrs. J. T., Washington.
Townsend, W. G., Baltimore, Md.; Tucker, F. E. S., Battle Creek, Mich.; Tripp Adv. Agency, W. H., New York City.
Wessinger, J. A., Ann Arbor, Mich.; Wood, W. F., Mishawaka, Ind.; Wharton, J. E., Chrisman, Ill.; Weeks Drug & Chemical Co., Jackson, Mich.

THE PUBLIC SERVICE.

Movements of Army Medical Officers.—To Santiago, Cuba, via New York City, First Lieut. E. Howell, 5th U. S. Vol. Infantry, from the general hospital, Ft. McPherson, Ga., to join his regiment, and the following acting asst.-surgeons: George B. Heinecke, Alexander McF. McMaster, Samuel L. Hannon, Edwin P. Hayward, Dudley W. Welch and Wm. H. Block, all from Washington, D. C.

To Ponce, Porto Rico, via New York City: Acting Asst.-Surgeons W. C. Berlin, J. Carlisle DeVries, George G. Morris, from Washington, D. C.; H. E. Sears from Camp Wikoff, L. I., and Robert W. Andrews from Camp George H. Thomas, Ga.

To duty at Camp Meade, Middletown, Pa.: Acting Asst.-Surgeon Geo. Dock. To duty at Camp Hamilton, Lexington, Ky.: Acting Asst.-Surgeons Harry R. Lemen from Camp Wikoff, L. I., and H. L. Gilchrist from Camp George H. Thomas, Ga. To duty with troops at Anniston, Ala.: Lieut. Marshall M. Cloud, asst.-surgeon U. S. A., from the U. S. general hospital at Ft. McPherson, Ga. To duty with troops at Jacksonville, Fla.: Acting Asst.-Surgeon Raphael Echeverria from Tampa, Fla. To duty with troops at Willet's Point, N. Y.: Acting Asst.-Surgeons H. W. Eliot and R. C. Holcomb from Camp Wikoff, L. I. To report to the Surgeon-General at Washington, D. C.: Lieut.-Col. Rush Huidekoper, chief surgeon U. S. Vols., from duty in Porto Rico; Acting Asst.-Surgeon H. Lincoln Chase from Ft. Crook, Neb.

Honorably discharged: Majors George Cook and Clayton Parkhill, chief surgeons of volunteers, Major W. H. Devine, brigade surgeon, and Major Thomas G. Summers, surgeon 2d Tennessee Inf. and brigade surgeon of volunteers.

Resigned: First Lieut. Frank E. Bateman, asst.-surgeon 5th Massachusetts Infantry; First Lieut. Norman D. Harvey, asst.-surgeon 1st Rhode Island Infantry; First Lieut. Charles H. Schlichter, asst.-surgeon 3d New Jersey Infantry, and Capt. Theodore Rethers, asst.-surgeon 1st California Infantry.

Acting Asst.-Surgeon Donald Mclean from Detroit, on duty at Camp Meade, is the son of Donald Maclean, Sr., who is on duty as chief surgeon of division at Ft. Monroe, Va.